# THE IRON AGE

New York, January 15, 1925

ESTABLISHED 1855 VOL. 115, No. 3


# Continuous Molding and Casting

## What Conveying Machinery Can Accomplish Shown in Plant of Warren Foundry Co. at Warren, Ohio

A HIGHLY specialized production foundry in which hand labor has been reduced to a minimum and designed for continuous molding and pouring and equipped with conveyors for handling molds and flasks was placed in operation Jan. 8 by the Warren Foundry Co., Warren, Ohio. This foundry has a number of highly interesting features in the design and in the extent to which the saving of labor has been effected.

One of the most outstanding of these is the method adopted for pouring the molds. These are carried on conveyors directly in front of the cupolas, where an unique system of pouring is provided that avoids the lifting of metal in ladles by hand power or by an overhead conveying system. In fact, the pouring method is almost as simple and free from manual labor as it would be were the metal run directly from the cupola spouts into the molds. The system for handling and preparation of sand is entirely mechanical and the sand is delivered to machine from hoppers located above the machines so that none of the molder's time is taken up in shoveling sand. With the use of mold conveyors no molds are placed on the foundry floor.

The foundry is specialized to the extent that it will make only one grade of iron. It will specialize on automobile pistons made in green sand, but it will make a variety of castings for automobiles and other uses that require close grained metal with machinability or qualities similar to those required in piston castings. The plant is equipped for making castings in sizes from 1 oz. to 50 lb. The foundry charge will be standardized for all products and will include No. 2 foundry pig iron, a small quantity of steel scrap in the form of short sections of old rails, Mayari pig iron and chrome nickel steel. The foundry has a melting capacity of 85 tons in 9 hr. and it is scheduled to produce 25,000 automobile pistons in that time. With the saving of labor that is being effected it is expected that the daily output will be 1 ton of castings for 1¾ men, counting all the men that are employed.

Two Molding Units Looking from the Start of the Conveyor Lines Toward the Cupolas, Which Are Back of a Brick Wall at the Lower End of the Molding Floor. The two inner conveyors are the mold conveyors and the two outer conveyors are the roller carriers for empty flasks

The foundry has two complete continuous molding units, each consisting of an empty flask conveyor and mold conveyor with a line of molding machines between the two conveyors. Differing from the conveyor arrangement in some continuous foundries, the conveyors extend in parallel straight lines from the start in the molding floor, one line on each side of the cupolas and on to the shake-out grates. The arrangement is very compact as the molding floor, including the double line of conveyors, occupies only 100 x 30 ft. in area and sufficient space is left between the conveyor units for 32 benches if needed. The total length of the conveyors through the molding floor, pouring zone and to the shake-out grates is 200 ft.

Each conveyor is a combination power and roller conveyor. The mold conveyor is power driven to a point just beyond the pouring zone and from that point to the shake-out grates there is a roller conveying section. The molds as they are delivered from the power conveyor push the row of molds along the roller conveyor until they fall off the end on the shake-out grate. The return gravity conveyor has a power section of about 50 ft. long adjoining the shake-out grates and the remainder of this conveyor including the section along the molding machines is of the horizontal roller type. The row of empty flasks is pushed along this roller conveyor on their bottom boards as the flasks are delivered from the power section of the conveyor.

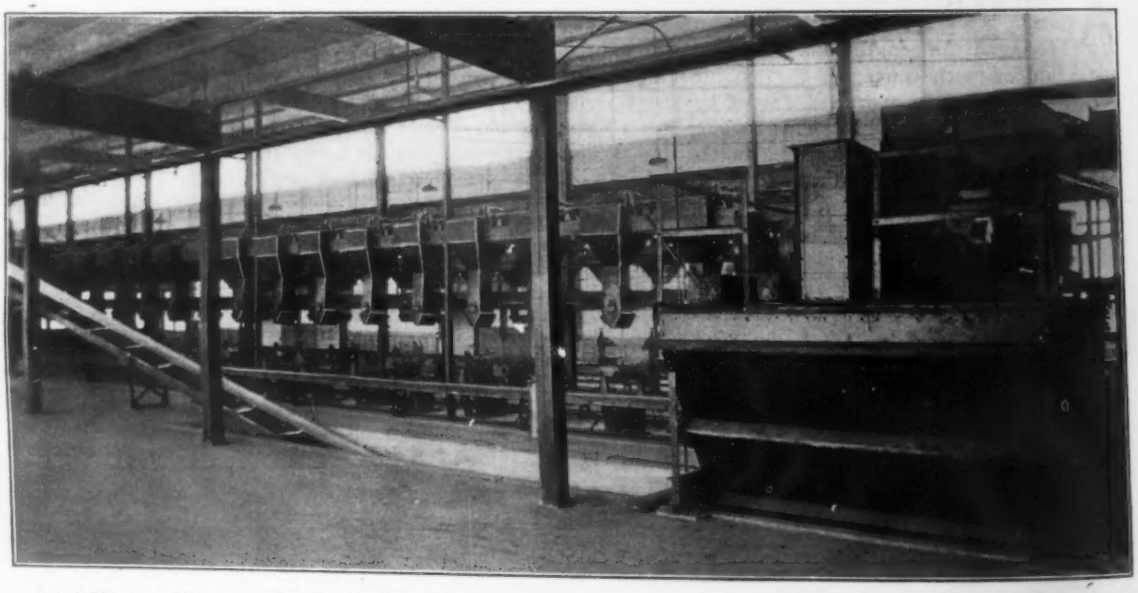
The drag mold is made on Osborn Mfg. Co. rollover machines and the cope on a special type of jolt strip machine, the cope and drag machines being arranged alternately. All are air operated. There are sixteen each of the drag and the cope machines and in addition eight air squeeze machines built by the William H. Nichols Co., Inc.

A concrete base extends along the floor on which the molding machines are set. Lengthways in this base are two slots for holding the machines to the base. This arrangement makes it easy to change the position of a machine or to take out one machine and substitute another in its place.

The mold conveyor consists of an endless chain operated between T rails. This is an unusually narrow conveyor, its width from the outside of the rails being only 7 in. The bottom boards carrying the molds are pushed along on the conveyor rail by push blocks or raised links on 36-in. centers that extend up from the conveyor chain. Cast iron bottom boards of a standard design built in various sizes are used. These have flanges on each side to guide the boards on the rail. Six projecting lugs on the under side of the bottom boards take up the wear on the rails. Openings are provided in the bottom boards for venting. The conveyor has a capacity for handling flasks up to 24 x 30 in., or three snap flasks can be placed in one of the 30-in. spaces between conveying blocks.

The molders lift the empty bottom boards and flasks from the return conveyor and after the molds are made deposit them on the mold conveyor, the cope mold being placed on the drag as the latter passes the cope machine. In making the molds and in handling the empty flasks and molds the molders hardly have to step out of their tracks. There are 32 sand hoppers on 5-ft. centers or one above each machine. The air for operating the machines in each unit is conveniently carried in a 2-in. line that extends under the return conveyor. Each machine also has a blow pipe for blowing and spraying.

The melting equipment consists of Whiting cupolas lined down to 48 in. and designed for continuous pouring. These are operated alternately, each a 9-hr. day.



Sand Hoppers Above the Molding Machines. At the right is the revivifier and sand storage hopper, the latter partly in a pit. An inclined belt carries the sand from the hopper up close to the roof and there the sand passes to the distributing belts

The cupolas are located between the two conveyor lines and pouring is done from each side of the cupolas. Between the cupolas is located a ladle of 1500 lb. capacity mounted on a steel frame and the cupola is poured from its side into this ladle. The ladle which is called a dispensing ladle has two spouts on opposite sides facing the conveyors. The ladle is tilted either way by a rack and arm with a universal joint so that its operator is kept several feet from the hot metal.

The dispensing ladle is poured into a pouring ladle of 300 lb. capacity mounted on a pedestal, one of these ladles being on each side facing the mold conveyor. These small ladles have a spout 48 in. long for pouring the molds. The pouring ladle is unique in design. It has six separate motions so that the moving mold can be followed until finished and it is so constructed with a spring arrangement that it stands at a fixed level during all stages of pouring, regardless of the amount of metal in the ladle.

Only three men are required for pouring and it is expected that they will easily handle 85 tons of metal during a working day. One man serves the dispensing ladle, keeping the two pouring ladles full of metal. The other two pour the molds. The speed of the conveyor through the pouring zone is 8 to 12 ft. per minute.

Truck for Handling Sprues and, Suspended from the Hoist, One of the Tote Boxes for Handling Castings

Overhead hoists are provided for moving the ladles a few inches from one cupola to another as a change in cupola is made. The cupolas and pouring zones are mostly inclosed with brick partitions, openings in which are provided for the conveyors, so that the smoke and heat are well confined to that part of the foundry.

The mold is weighted down as it passes from the foundry floor. After it is poured and the metal has set, a man stationed at the side of the conveyor beyond the pouring zone removes the weight, which he places on a gravity roller conveyor that runs above the empty flask conveyor, curving over to the mold conveyor. Here an attendant takes the weight from the conveyor and places it on another mold that is ready for pouring.

On leaving the pouring zone the molds pass from the power to the roller section of the conveyor and the row of molds is pushed along to the shake-out grates. The castings and sand drop from the flask in the fall upon the grate. A workman picks up the castings, knocks off the sprues into a side dump car that runs on a track across the foundry floor, and they go back to the cupola charging floor. Castings are placed in pressed steel tote boxes of 1 ton capacity, 48 in. long, 28 in. wide and 18 in. deep, slightly wider at the top than at the bottom and having perforated sides, to aid in cooling, and trunnions on the ends for handling.

A very complete system of overhead monorail tracks is provided for handling the castings from the shake-out to the cleaning, grinding and assorting operations. This was supplied by the Richards-Wilcox Mfg. Co. and is equipped with 1-ton hand hoists made by the Wright Mfg. Co. Cleaning is done in three 48 x 84-in. Whiting tumbling mills, each barrel having an independent operating clutch. The tote boxes are emptied into the barrels and the castings are dumped back into the boxes after cleaning and the latter are deposited on a roller conveyor that is located in front of the grinders, the boxes being pushed by hand along this roller table as the castings are needed. After grinding, the castings are thrown back in the tote boxes. There are three 22-in. grinding machines, two with double wheels and one with a single wheel and disk. These were built by the U. S. Electrical Tool Co. Each grinder has individual push button control. No cored molds will be made in the foundry but a small core machine is provided for making pin cores and drawer gates.

The Conveyor Lines at the Shake-out Ends. Looking at the unit at the right the return conveyor for empty flasks is in the foreground and the mold conveyor back of it. Part of the sand handling system is shown in this picture. Through the shake-outs in the floor the sand falls upon a belt which delivers to the elevator at the left and in turn the riddle, a magnetic separator and the incline belt to the revivifier shown on page 188. Sprues are handled in trucks on the track in the foreground. Castings are loaded in 1-ton tote boxes and are carried by the monorail to the tumbling barrels located at the right but not appearing in the picture

After grinding, the hoist places the boxes of castings on assorting and inspecting tables back of the grinding machines. A piston or other small casting, taken from the assorting table every 30-min. run, is put on a lathe to determine the metal hardness and a piston is cut in two by a hack saw to check the thickness of the metal. A loading platform at the side of the plant has room for four cars. There is also a spur track 1000 ft. long that serves the raw material storage yard. An electric traveling crane will be installed over this yard.

A complete cupola charge of pig iron, coke, scrap and limestone is made up in each cupola charging car, each material being weighed separately. The cars are conveyed to the cupola charging floor on a Whiting air operated elevator and the cupola is charged by hand.

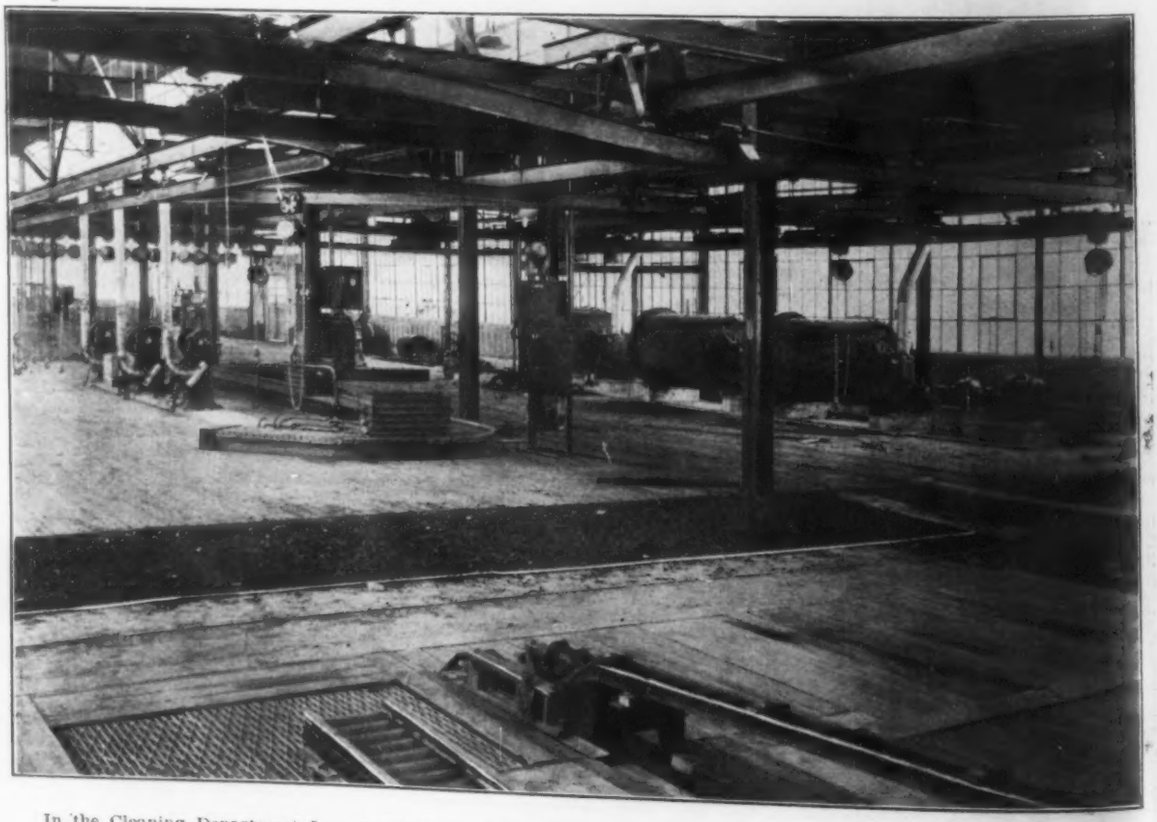
The sand from the shake-outs drop onto a 24-in. metal belt, new sand being added as required by shoveling from the floor to the belt. From the belt it is elevated 18 ft. above the floor and discharged onto a revolving riddle from which it passes through a metallic separator. From here an 18-in. rubber belt operated on an incline elevates it to a revivifier which conditions the sand. Under the revivifier is a main storage hopper which extends about 10 ft. above the floor level and down into a concrete pit. From the bottom of the storage hopper the sand passes onto an inclined distributing belt that carries it up to a cross belt that feeds the two belts that serve the hoppers above the molding machines. Sand that is not fed into these hoppers is carried to the lower end of the hopper belts and passes to another cross belt that delivers it back to the main hopper. The two conveyor belts that carry the sand from the shake-out to the molding end of the foundry are in a parallel with the molding conveyors. The entire sand handling and mold and flask conveyor equipment was furnished and installed by the C. O. Bartlett & Snow Co. The roller conveyors were made by the Mathews Gravity Carrier Co.

Blast for the two cupolas is supplied by one direct pressure Root blower. Air for the molding machines and for other purposes is supplied by an Ingersoll-Rand two-stage air compressor with a capacity of 558 cu. ft. per minute at 100 lb. pressure. Dust is exhausted from the tumbling mills and grinding machines by a system installed by the New Haven Sand Blast Co.

The foundry is completely equipped electrically for all power requirements and is provided with adequate push button control for moving mechanism. Current is reduced from 2300 to 220 volts on two 150-kva. Packard Electric Co. transformers and there is a 15-kva. balancing coil for the light circuit.

The foundry occupies a one-story monitor type building, 90 x 440 ft. in size, having three 30-ft. bays. It is of steel and brick construction with ribbed glass windows and steel sash, and has a wood floor. The side bays are 14 ft. high and the center bay 23 ft. in height. It will be noted that it was possible to install a complete sand handling system without the necessity of a building of greater height. The building is steam heated with radiators the full length on either side. Lockers, lavatories and showers are provided on a mezzanine floor. With such lighting and heating facilities, together with the general arrangement, the management feels that it could have done little if anything more in making the foundry a clean and comfortable place in which to work.

The builders of the plant have had long experience in operating foundries in automobile production work. F. B. Whitlock, the president, was for many years up to June, 1923, president and general manager of the



In the Cleaning Department Is a Complete Overhead Conveyor System and Tumbling Mills at the Right and the Grinding Machines at the Left. After tumbling, a monorail hoist places the tote boxes of castings on the roller conveyor in front of the grinders and the grinder operators push the boxes along on the table to points back of the machines. After grinding they throw the castings back into the boxes and push them to the end of the roller conveyor. Thence the hoist takes the boxes to the assorting benches back of the grinding machines. The castings pass through doors at the left to the loading platform

The Cupola House Is Built Into and Forms a Part of the Main Foundry Building

Interstate Foundry Co., Cleveland, previously having been associated with the National Malleable Castings Co. E. W. Beech, the vice-president and secretary, was formerly president and general manager of the Manufacturers Foundry Co., Waterbury, Conn., and later was connected in the same capacity with the Ferro Machine & Foundry Co., Cleveland. E. B. Hite, the treasurer and plant manager, was formerly affiliated with the Lancaster Steel Co., Lancaster, Pa. L. C. Miller is metallurgist in charge of cupolas.

## Carnegie Steel Co. Will Proceed with Erection of Mills at McDonald Works

YOUNGSTOWN, Jan. 13.—District officials of the Carnegie Steel Co. have received authorization to proceed with the construction of a 10-in. shape, 12-in. strip and 14-in. bar mill at the McDonald works, in Trumbull County. I. Lamont Hughes is district superintendent at Youngstown. Buildings for the new mills were constructed some time ago. Estimated cost of the installation is $2,000,000.

With this addition, there will be nine mills in the McDonald group, as originally contemplated. The present group of six mills receives electrical power from the Ohio Works, at Youngstown, about six miles distant, and the new units will receive power from the same source. Their steel supply will also come from the Ohio Works steel plant.

The Carnegie company will have 21 bar mills in the Mahoning Valley upon the completion of this installation. It is not improbable that some of the company's older-type mills at the Upper and Lower Union plant in Youngstown will be discarded in the course of time.

The new McDonald mills will bring additional skilled and semi-skilled workers to augment the population of the village of McDonald, which the company created in connection with its plant. The town site was laid out by the company's engineers and most of its houses were erected by the Carnegie company's housing department, or under its direction.

## Giving Weights in Requesting Bids on Castings

What may be submitted as following up recent contentions of Thomas E. Durban, Erie, Pa., that the weights of castings should be indicated on blueprints offered in connection with requests for bids on casting work is given in the subjoined. It will be recalled that Mr. Durban has aired this subject in THE IRON AGE and also discussed the question at the meeting of the National Founders' Association as covered in the report of that meeting in early November. Mr. Durban's further argument is as follows:

"1.—It would greatly facilitate prompt quotation and thus expedite business. Often the foundries receive in one mail a large number of prints, from 10 to 20 is not uncommon. When the casting is somewhat complicated, and many of them are, it is safe to say it takes 3 to 4 hr. to get the weight of each print figured and conveyed to the labor estimator before the estimated overall cost can be figured.

"2.—The weight must be known if the piece has been in the sand before or must have been figured by the designing engineer before the design could be accepted by the management, as very few designs of any kind are accepted unless the approximate cost accompanies the design, and the approximate cost cannot be given if weights have not been figured. It therefore follows that somebody must have figured the weight, and it would require no time to put the weight on the print.

"Now, suppose the print was sent to five foundries for competitive prices. It necessarily follows that five men must figure the weight, and five men are engaged in doing the work that has already been done by one man. The man competent to estimate a comparatively intricate casting from a print would surely command a salary of $3,000 a year, or $10 per day of 8 hr., or $1.25 per hour, and it would consume at least 4 hr. time to figure and check. This would entail an actual labor expense, not including overhead which such a man would have to carry, of $5 by each company. So that if five bid on the work, it would entail a total cost of $25 plus the overhead of 50 per cent, or $37.50 actually wasted on each print. This waste must be covered in the operating overhead and be reflected in the price.

"When the total number of prints sent out for figures throughout the industry for a year is considered, it is astounding to think what the waste actually is.

"Further, a blueprint should accompany every order so that the foundry may have an intelligent knowledge of where the casting is to be machined, how the cores are to be set, and further information that would be of assistance to the workmen. The print should be in the hands of the foundry inspector so that the castings may be carefully checked and delays in replacement avoided, if an error be made, thus saving time and freight expense that would accrue if the rejection be made at destination instead of at the source of production."

## Warehouse Business in November

Sales of iron and steel jobbers in November, 1924, showed a drop of 11.2 per cent from the volume of sales of October, according to the statistics collected by the American Iron, Steel and Heavy Hardware Association. In a bulletin from A. H. Chamberlain, secretary-treasurer of the organization, Marbridge Building, New York, it appears that the November percentage of business was 134 compared with 100 for January, 1921, which month was used as a basis, and the October percentage was 150. As compared with November, 1923, November of the past year showed a decrease of 3.5 per cent. The greatest percentage of decrease occurred in the section covered by Pennsylvania and all the states south of the Ohio and east of the Mississippi. In New England, New York and New Jersey, the percentage decrease was something over one-half as much, while for the rest of the country the decrease was only 2 per cent, comparing the one month with the other.

## SOUNDS NOTE OF WARNING

### President Foster Says Conditions Favoring Prosperity Are Largely Temporary

William H. Foster, president of the General Fireproofing Co., Youngstown, and a former general sales manager of the Youngstown Sheet & Tube Co., warns against over-optimism with respect to this year's business prospects. Mr. Foster sees elements of instability in the conditions which have brought about current activity in manufacturing.

"We doubtless will find this year that history will repeat itself and since the history of business is one of ups and downs, we probably shall have the usual period of reasonable prosperity—say, six months—during which time we will become a little more extravagant than we should, and then along will come hard times, which will force us to be more economical and live the simple life," he argues. "For is it not true, that when we come to analyze the conditions that have brought about and are bringing about business activity, we find that in the main they are of a temporary nature, rather than permanent?

**Failure of Crops in Foreign Countries**

"The first important element, perhaps, is the high price of farm products, which is enabling the farmer to increase his purchasing power. These high prices are doubtless due to the partial crop failure in the Argentine and Canada, and the almost total crop failure in Russia. If the Argentine crops which are now in the making should prove to be of the bumper variety, and if Canada and Russia have good crops, then naturally the prices of our farm products will again fall.

"We are more nearly back to what might be termed a normal, post-bellum basis than at any time since the war, this due to the fact that, with the exception of Russia, European finances are well on the way toward solution, which will mean a resumption of normal manufacturing, buying and selling in the old world. This condition will help, but it must be borne in mind that in assisting these European countries to again stand alone and to increase their purchasing power we are also assisting them to become more active competitors.

**Henry Ford's Purchase of Rails**

"More especially is this so when we recall that, with prevailing labor rates at about one-half of those in effect here, they not only are able to undersell us in neutral markets, but can, if they wish, apparently do so in our own country (as is evidenced by the fact that Henry Ford has recently bought a large tonnage of rails in Belgium), pay the ocean freights, pay the American duty, pay the freight from the seaboard to central Ohio, and land goods here at a lower price than that of our own makers.

"Also, large quantities of iron, steel, cement and miscellaneous products are being shipped into this country at prices, in many cases, below our cost of production, notwithstanding the prevailing high tariff rates.

"Is it not evident, therefore, that until our costs are so reduced, or foreign costs so increased, that we are able to compete again in foreign markets, as well as secure all of the tonnage in our own country, we can hardly expect, for any long period of time, to enjoy trade activity, especially in the steel business?"

Mr. Foster states that the Fireproofing company is extending its business in foreign markets and is shipping to such far distant points as Bombay, Shanghai, Calcutta, Sydney and other cities.

## Large Increase in Steel Corporation's Unfilled Orders

Unfilled business on the books of the United States Steel Corporation as of Dec. 31, last, aggregated 4,816,756 tons, or 784,787 tons more than remained unfilled Nov. 30, and the largest amount recorded since February, 1924. In November the unfilled tonnage increased 506,699 tons, in October 51,490 tons, in September 184,203 tons, and in August 102,505 tons, while in July it decreased 75,433 tons, in June 365,584 tons, in May 580,358 tons, in April 574,360 tons, and in March 130,094 tons. In February there was an increase of 114,472 tons in the unfilled business, and in the first month of 1924 an increase of 353,090 tons. A year ago the unfilled business was 4,445,339 tons, or 371,417 tons less than for December, 1924. With the exception of February, 1924, the corporation in December had more unfilled business on its books than at any previous time since September, 1923. Following is the unfilled tonnage as reported by months beginning with January, 1922:

| | 1924 | 1923 | 1922 |
|---|---|---|---|
| Jan. 31 | 4,798,429 | 6,910,776 | 4,241,678 |
| Feb. 29 | 4,912,901 | 7,283,989 | 4,141,069 |
| March 31 | 4,782,807 | 7,403,332 | 4,494,148 |
| April 30 | 4,208,447 | 7,288,509 | 5,096,913 |
| May 31 | 3,628,089 | 6,981,351 | 5,254,228 |
| June 30 | 3,262,505 | 6,386,261 | 5,635,531 |
| July 31 | 3,187,072 | 5,910,763 | 5,776,161 |
| Aug. 31 | 3,289,577 | 5,414,663 | 5,950,105 |
| Sept. 30 | 3,473,780 | 5,035,750 | 6,691,607 |
| Oct. 31 | 3,525,270 | 4,672,825 | 6,902,287 |
| Nov. 30 | 4,031,969 | 4,368,584 | 6,840,242 |
| Dec. 31 | 4,816,756 | 4,445,339 | 6,745,703 |

The forty-fifth annual meeting of Rogers, Brown & Co., pig iron merchants, was held in Cincinnati, Jan. 5 and 6. In attendance were all members of the firm, branch office managers and salesmen, sessions being held at the Business Men's Club. Reports submitted to the meeting from all sections of the country were very optimistic regarding the future of the iron industry, salesmen generally reporting that foundries were getting more business.

## Sheet Steel Executive Meeting Again to Be at White Sulphur Springs

The third annual convention for administrative, commercial and operating executives of sheet steel companies, like the two preceding ones, is to be held at the Hotel Greenbrier, White Sulphur Springs, W. Va., on May 4 to 7, inclusive. W. S. Horner, president National Association of Sheet and Tin Plate Manufacturers, is general chairman of the general convention committee, other members of which are William U. Follansbee, president Follansbee Bros. Co., Pittsburgh; Walter C. Carroll, vice-president Inland Steel Co., Chicago; Charles R. Hook, vice-president American Rolling Mill Co., Middletown, Ohio, and Walter E. Watson, general manager of sales Youngstown Sheet & Tube Co., Youngstown, Ohio. The convention will open with a get-together meeting and banquet on Monday evening, May 4.

Programs, papers and addresses for the three days of the convention proper will be related to problems of administration, distribution and production. A separate committee will have charge of each day's program. For the first day's session the committee is William U. Follansbee, chairman; R. D. Campbell, vice-president Allegheny Steel Co., Brackenridge, Pa., and A. N. Flora, vice-president Trumbull Steel Co., Warren, Ohio. For the second day, Walter C. Carroll, chairman; G. H. Charls, vice-president United Alloy Steel Corporation, Canton Ohio, and W. H. Abbott, vice-president Wheeling Steel Corporation, Wheeling, W. Va., and for the third day, Charles R. Hook, chairman; J. B. Andrews, vice-president Newport Rolling Mill Co., Newport, Ky., and H. A. Roemer, vice-president Superior Sheet Steel Co., Canton, Ohio.

The Rockport Steamship Co., Cleveland, has placed a contract with the Manitowoc Shipbuilding Corporation, Manitowoc, Wis., for a large Lake boat to be used in the stone and coal trades.

# Getting Castings Out on Schedule

## Planning and Controlling Production in Plants of All Sizes —Aids in Determining Costs—Improving Production Inspection

IN the foundry industry the psychological moment to make deliveries is when deliveries are promised. The future in this business as in any other is built upon making prompt deliveries. Making promises and then falling down because emergency orders disrupt the schedule is a pretty much broadcasted foundry failing. Many times causes beyond its control make a foundry fall down on deliveries, but in instances where the management has been awakened to the advantages of exercising practically complete control to insure delivery as promised, there have been returns in orders for full quantities to one company in place of partial orders farmed out to several foundries.

The following table gives an idea of the proportion of plants giving some attention to the control of production:

| Size of Foundry (No. of Men) | Exercise Some Control | | Lack of Control | |
|---|---|---|---|---|
| | Number | Per Cent | Number | Per Cent |
| Not over 50 | 0 | 0 | 7 | 100 |
| 50 to 100 | 5 | 50 | 5 | 50 |
| 100 to 150 | 11 | 65 | 6 | 35 |
| 150 to 200 | 3 | 75 | 1 | 25 |
| 200 to 500 | 6 | 100 | 0 | 0 |
| 500 and up | 10 | 100 | 0 | 0 |
| Totals | 35 | 65 | 19 | 35 |

The degree of control exercised varies greatly. Completely developed systems of planning and controlling production found in large plants permitted maximum use of the plant's facilities. Making sales fit facilities and planning the time and place when steps in the production program were to be carried out in advance of production insured full utilization.

### Control of Production in Small Plants

Some of the small plants visited had effective systems for planning and controlling production. While resembling the general methods encountered in larger units, they naturally curtailed many of the activities incident to complete control. For instance, time studies had not been made in any of these plants, yet steps had been taken to standardize performance. One plant, having a fairly stabilized run of work, studied the output of each department over a period, determined the maximum output and found that 80 per cent of this was a fair standard to set. Performance over this set rate was rewarded by a bonus.

While the functions underlying a larger system are maintained in small plants, in the smaller plants a number of functions may be vested in one man. Some of the advantages and economies common to larger plant operations are possible in those smaller units which determine in advance the functioning of the plant in the performance of a given order and organize men, equipment and materials for its execution.

A plant typical of the medium size jobbing foundry was operated under a system for planning and controlling production which enabled profitable employment of the facilities of the plant. This system, outlined below, describes in a general way methods used in several of the medium size plants visited.

*THIS is the third of a series of ten descriptive studies of management practices in the foundry, made by the Metropolitan Life Insurance Co., New York, as a service to its group insurance policyholders in the foundry industry. Copious abstracts of the first and second appeared at page* 1334, THE IRON AGE, *Nov.* 20 *and at page* 1552, *Dec.* 11.

### Planning and Controlling Production in a Plant Employing 100 Men

The work turned out, the size of departments and the equipment used will give a picture of this jobbing plant. The foundry pours about 15 tons a day. Bench and squeezer molders turn out castings from a few ounces to 10 lb. in weight; this work comprises the majority of the output. There are, however, two other departments—the rollover section, working on medium size plate work and some heavy cored work; the floor molding section, turning out castings on orders requiring small quantities of large castings.

Molders pour and shake out castings. Laborers assist floor molders and rollover machine operators

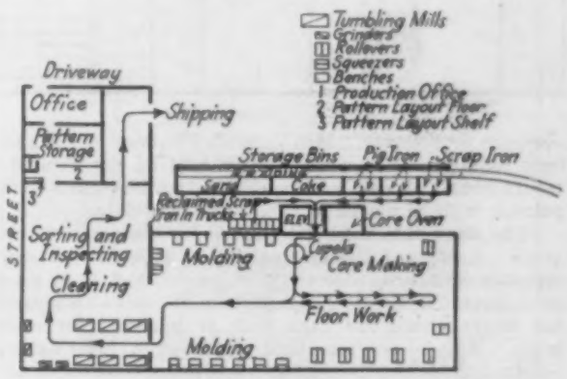



Fig. 1. Departmental Layout

and help in pouring and shaking out. A night crew cleans the foundry and prepares sand for the next day. The following table shows the size of departments:

| | |
|---|---|
| EXECUTIVES | 3 |
| Owner (sales and finance) | |
| Production manager (sales, purchasing, production and costs) | |
| Superintendent (production, maintenance and employment) | |
| FOREMEN | |
| Floor molding and rollover | |
| Bench and squeezer | |
| Cleaning and labor gang | |
| Core making | |
| CLERICAL | 4 |
| Pattern clerk | |
| Production and cost clerk | |
| Office and billing clerks (2) | |
| MELTING | 5 |
| MOLDING | 43 |
| Bench work (8) | |
| Squeezers (18) | |
| Rollover (7) | |
| Floor (10) | |
| CORE MAKING (Two ovens, one small and and one large) | 11 |
| Bench (6) | |
| Large work (4) | |
| Oven tender (1) | |
| CLEANING | 4 |
| Sandblast (1) | |
| Mills (2) | |
| Grinder (1) | |
| SHIPPING | 1 |
| INSPECTION AND WEIGHING | 2 |
| LABORERS | 23 |

Capacities of departments had been carefully investigated and weak points which might prove "necks in the bottle" were built up to rated capacity. Fig. 1 is a sketch of the departmental layout of this plant.

*Planning for Production.*—On receipt of an order the production department analyzed the order and prepared for its production by determining the following factors: Type of work—whether for floor, bench,

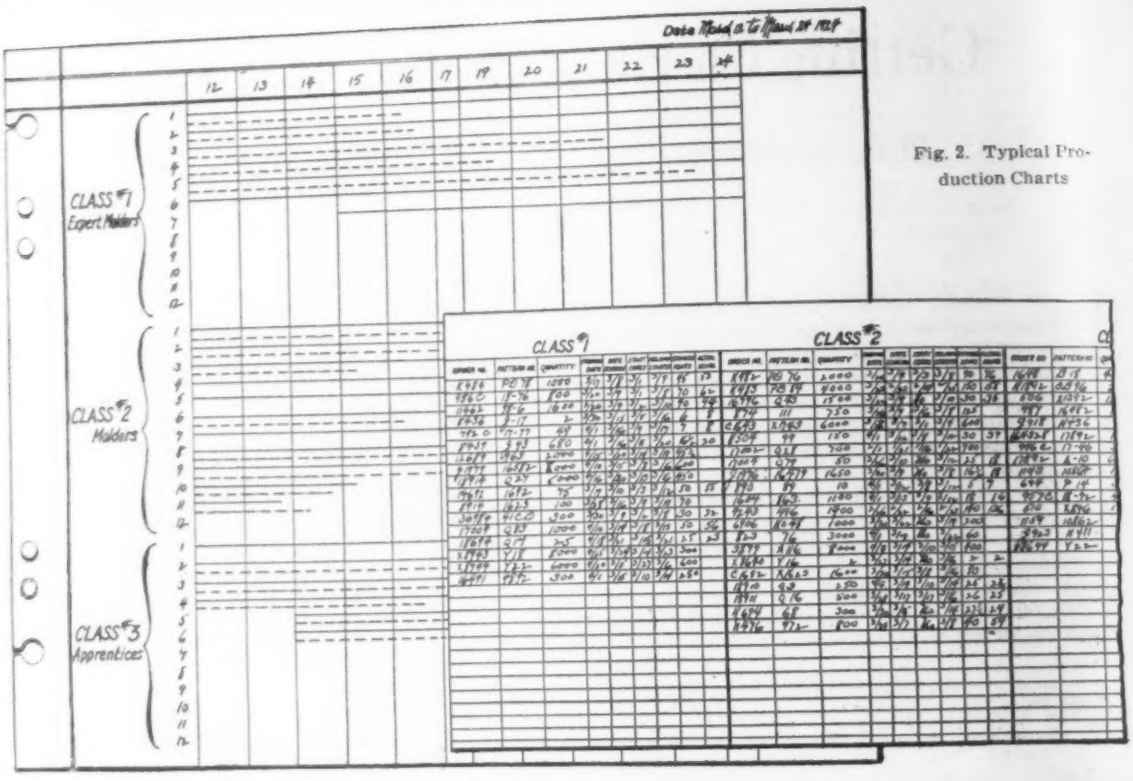



Fig. 2. Typical Production Charts

squeezer or rollover. Men capable of doing work and time required to do work (determined by experience). Hours ahead of men and equipment to determine date pattern is to be placed in sand and finish date.

The same data were determined for the core department. A copy of the original order with the delivery schedule was forwarded to the shipping clerk to be used as a check. A simple graphic chart showed at a glance the hours ahead for each man or machine for each week. This chart was kept up through information received from the production records.

Fig. 2 is typical of production charts used. The solid line in each instance designates the estimated hours of work ahead. The dotted line shows the progress reported on the work. The reverse of the chart gives detailed data on orders going through during the period. Charts are kept in chronological order in a loose leaf binder for ready reference.

*Orders.*—The production order (Fig. 3) gave data concerning the pattern number, the number on the order, the name of the part and the customer. The daily production was recorded and a daily schedule is given on the order with which to compare actual production. To eliminate all possible difficulties in molding, provision was made on the production order to list difficulties experienced on previous runs. The production data on the order was used in figuring costs.

Core order (Fig. 4), gives complete data concerning the patterns, core boxes and number of cores to be made, as furnished the core department on this order.

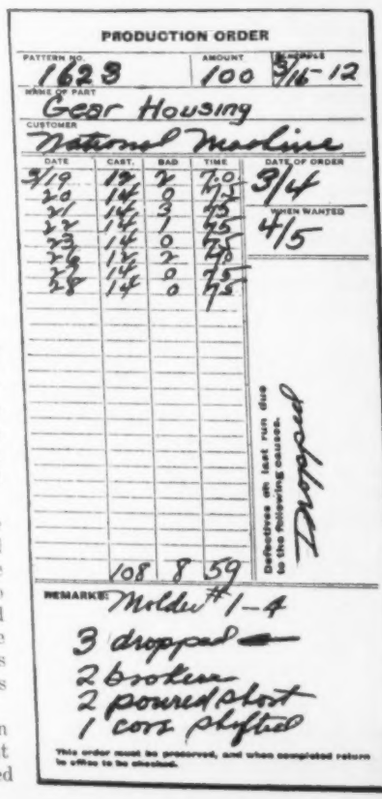
Storage records were consulted concerning the availability of core boxes and flasks for the order. If any of this equipment was missing, the production department notified the purchaser in the case of patterns or core boxes, and issued orders on the carpenter shop for the preparation of suitable flasks. All equipment was ordered to be on hand previous to dates specified for the beginning of operation.

*Layout and Distribution of Work.*—Job tickets were routed through the pattern storage clerk, who removed from storage the patterns and core boxes wanted. He was in absolute control. He attached the tickets to their respective patterns and core boxes and placed them on the layout floor or layout shelf (Fig. 1). The layout shelf was designed to hold patterns and boxes due to go into the sand currently, and emergency orders requiring immediate attention.

The superintendent, in making his daily inspection for orders ahead in the layout room, would give first attention to this shelf. Reports of foremen advised him of work needed in their respective departments. Patterns would be assigned by the foreman to the man qualified for the particular type of work.

*Progress Records.*—In the production office a rack held the production orders assigned. A molder's name was placed over each section of the rack. As soon as the order was assigned to him it was placed in the rack under his name.

The production clerk checked molds made at the end of the molding period each day and entered the number of castings made on the production order. He checked bad castings on the following morning and made the entry on the production order. Comparison was made of the actual daily production with sched-


PRODUCTION ORDER

PATTERN NO. 1623 AMOUNT 100 SAMPLE 3/16-12

NAME OF PART Gear Housing

CUSTOMER National Machine

| DATE | CAST. | BAD | TIME |
|---|---|---|---|
| 3/13 | 12 | 2 | 7.0 |
| 20 | 14 | 0 | 7.5 |
| 21 | 14 | 3 | 7.5 |
| 22 | 14 | 1 | 7.5 |
| 23 | 14 | 0 | 7.5 |
| 26 | 14 | 2 | 7.0 |
| 27 | 14 | 0 | 7.5 |
| 28 | 14 | 0 | 7.5 |
| | 108 | 8 | 59 |

DATE OF ORDER 3/4

WHEN WANTED 4/5

Defectives on last run due to the following causes. Porosity

REMARKS Molder #1-4
3 dropped
2 broken
2 poured short
1 core shifted

This order must be preserved, and when completed return to office to be checked.

Fig. 3. Production Order for Molding

uled production as shown on the order, to check delay in delivery.

*Production of Cores.*—Core boxes were assigned to the core department in time to assure delivery of cores when the molders wanted them. The form shown in Fig. 4 was made up with a detachable stub. The production department was notified of the starting of the cores by the return of the stub. Provision was made also for checking inability of the core department to deliver as scheduled.

*Cleaning Castings.*—Castings were gathered from the molding floors and sent through the cleaning department. The cleaning foreman recorded the number of pounds of castings passing through his department daily.

*Inspection and Sorting.*—The next check on production was in the inspection and sorting of castings. Castings coming from the cleaning department were inspected and separated into individual orders. An inspection report contained the record of good and bad castings. This enabled the production department to issue a "replace order" to fill out the amount called for on the original order, in case of discrepancy.

*Shipping Department.*—The shipping department from its file of original orders called up orders previous to shipping date. When castings failed to come through by the date set, the shipping clerk notified the production department. The shipping department reported to the production department data on weights, quantities and method of shipment.

*Raw Materials.*—Metal, coke and sand requirements were estimated from past needs, and orders were given insuring delivery of materials. Contrary to the practice in a number of plants, no inventory of raw materials was kept. Visual inspection was the only check against depletion of stores.

*Metal Requirements.*—Daily melts were made up according to figures gathered from the foremen by the superintendent just before the blast was put on. The quantities for a given mix were set by the superintendent. He was guided by an outside laboratory retained to make tests of the melt three times a week.

### Control as an Aid to Cost Determination

From the time the order was received until the shipment of the finished castings was made the facilities of the foundry were concentrated on planning and carrying out production of the order to assure delivery at the date wanted.

Control in this plant might be strengthened. In passing from the molding floor to the inspection table little control was exercised on an individual order. A tie-up of some of the cleaning equipment might show up this weakness.

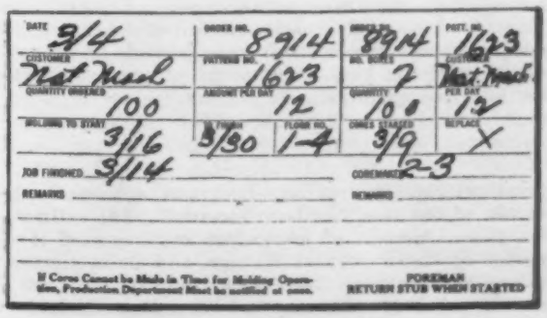
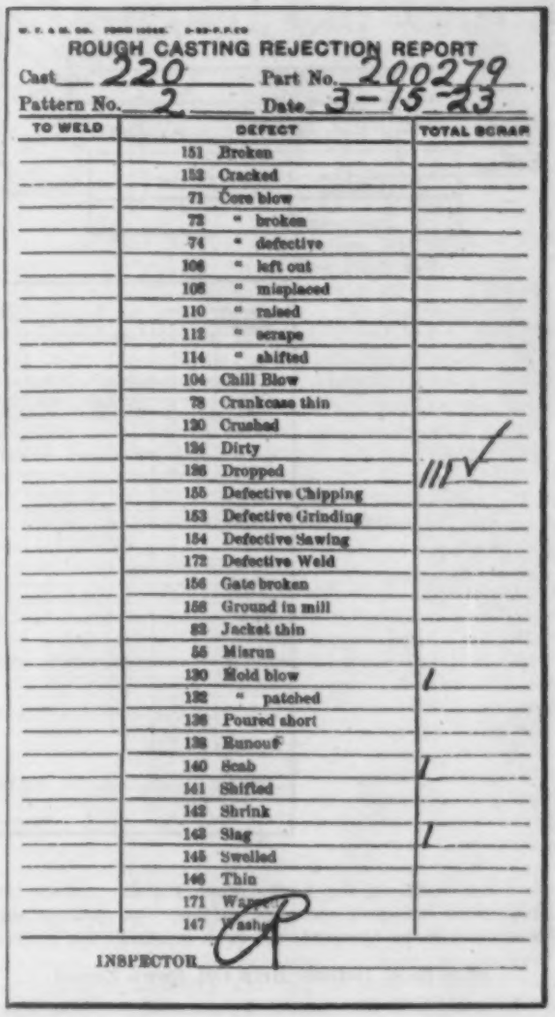

DATE 3/4 — ORDER NO. 8914 — ORDER NO. 8914 — PATT. NO. 1623
CUSTOMER Nat Mach. — PATTERN NO. 1623 — NO. BOXES 7 — CUSTOMER Nat Mach.
QUANTITY ORDERED 100 — AMOUNT PER DAY 12 — QUANTITY 100 — PER DAY 12
MOLDING TO START 3/16 — NO. FINISH 3/30 — FLASK NO. 1-4 — CORES STARTED 3/9 — REPLACE X
JOB FINISHED 3/14 — COREMAKER 2-3
REMARKS — REMARKS
If Cores Cannot be Made in Time for Molding Operation, Production Department Must be notified at once. — FOREMAN RETURN STUB WHEN STARTED

Fig. 4. Core Box and Core Record

Data gathered incident to production were assembled for cost information. It provided a means for accurate cost determination. Emergency and rush orders made it difficult for the production department to keep to schedule. Intelligent planning and manipulation of orders smoothed many rough spots. Four men on bench work were available for short rush jobs. At other times these men worked on repairs or orders due at a distant date.

Studying customers' needs proved a valuable aid in scheduling machine work. A particular order called for 75 castings per day. The production man knew that 50 were required for current needs and the 25 were excess. In such cases an emergency or rush order was put in the sand after the original customer's basic needs were fulfilled. Thus through exact knowledge of customer requirements a large amount of emergency work was handled with a minimum of broken schedules.


ROUGH CASTING REJECTION REPORT

Cast 220 Part No. 200279

Pattern No. 2 Date 3-15-23

| TO WELD | DEFECT | TOTAL SCRAP |
|---|---|---|
| | 151 Broken | |
| | 152 Cracked | |
| | 71 Core blow | |
| | 72 " broken | |
| | 74 " defective | |
| | 106 " left out | |
| | 108 " misplaced | |
| | 110 " raised | |
| | 112 " scrape | |
| | 114 " shifted | |
| | 104 Chill Blow | |
| | 78 Crankcase thin | |
| | 120 Crushed | |
| | 124 Dirty | |
| | 126 Dropped | 111✓ |
| | 155 Defective Chipping | |
| | 153 Defective Grinding | |
| | 154 Defective Sawing | |
| | 172 Defective Weld | |
| | 156 Gate broken | |
| | 158 Ground in mill | |
| | 82 Jacket thin | |
| | 56 Misrun | |
| | 130 Mold blow | 1 |
| | 132 " patched | |
| | 136 Poured short | |
| | 138 Runout | |
| | 140 Scab | 1 |
| | 141 Shifted | |
| | 142 Shrink | |
| | 143 Slag | 1 |
| | 145 Swelled | |
| | 146 Thin | |
| | 171 Warp | |
| | 147 Wash | |

INSPECTOR

Fig. 6. Daily Report Form for Causes of Defective Work

Fig. 5 shows the layout of inspection equipment for handling small castings in a large jobbing foundry. Castings were dumped on a table behind the grinder. As they were ground they were placed on the conveyor, which brought them to the inspector's table. The inspector examined the castings and placed them in the boxes provided for them. Trimmings were thrown on the table back of the castings table. Through this compact system, finishing, inspection and sorting of castings were accomplished.

### Methods for Improving Production Inspection

Inspection proved a control on production in several instances. It was realized that much difficulty and loss of good will were avoided by inspecting thoroughly before shipment. Lack of inspection or loose inspection costs much more than a thorough inspection system.

Some plants analyze causes for defective castings. Fig. 6 is the form used in the Wilson Foundry & Machine Co. to record causes of defective work daily.* Fig. 7 is the form used in this plant to summarize the daily reports for a period of one month. On the front of the card is space for the records of the first half

*A comprehensive series of five articles, dealing with the practice of the Wilson plant, was run in THE IRON AGE in 1923—at pages 745, March 15; 1037, April 12; 1173, April 26; 1562, May 31 and 212, July 24.

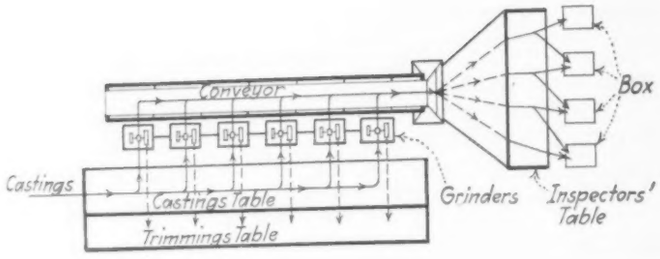



Fig. 5. Layout of Grinding and Inspection Departments

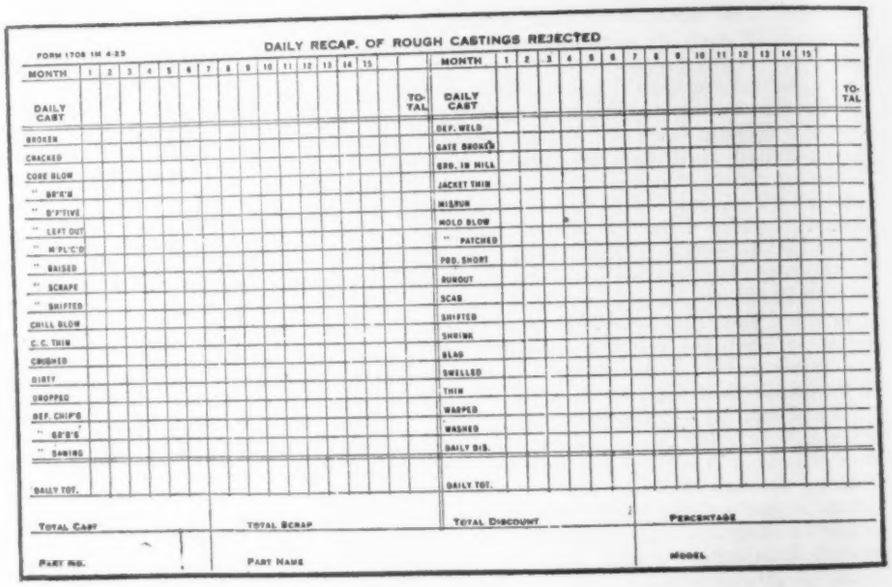



Fig. 7. Monthly Summary of Rejections

of the month; on the back, space for the remainder. This close analysis permits sifting out preventable losses and helps eliminate all such losses in the future.

### Records of Defects Help Cut Down Losses

In one plant the several departments were arrayed in competition. The arrangement might be called a foundry league. Each week the plant bulletin board contained the following records for each department: Total production by weight; total defective production by weight; percentage defective production by weight. This weekly publication set up a friendly rivalry between departments which effected a marked lowering in the percentage of work defective.

Two automobile foundries under continuous operation displayed charts with production figures to help control and encourage increase in output. In both instances blackboards were used on which hourly output by departments was recorded at the close of the hour. The figures of the day before were kept on the chart, to afford comparison. Here again the visual display of the results of departmental efforts and the rivalry resulting helped increase output and put more meaning into the work in hand.

### Production Control in the Foundry

Planning and controlling production enable foundries to specify and live up to delivery dates, to attain maximum use of facilities and to lower cost of operation. Sales are made more readily when assurance is given of delivery on promised dates. Production records help determine actual costs. Knowledge of plant facilities and capacity, a primary necessity to adequate production control, make possible an accurate estimate of the kind and amount of work necessary for effective operation.

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## Domestic Manganese Ore Shipments Increase in 1924

The shipments of high-grade manganese ore, containing 35 per cent and more of manganese, in the United States in 1924, according to preliminary figures compiled in the U. S. Geological Survey, were approximately 53,000 gross tons, in 1924, compared with 31,500 gross tons in 1923.

Notable increases in shipments were made by Colorado and Montana producers. In Washington, where no production of manganese ore had been made since 1916, a large quantity was produced and shipped from the Crescent mine, Port Angeles in 1924. This is the first time that Washington has made a notable production of manganese ore. It is largely shipments from Washington and the increase in those from Montana—from 21,916 tons in 1923 to about 34,000 tons in 1924—which have caused the increase in manganese shipments in 1924. It will be noted that Montana shipments alone in 1924 were 2500 tons higher than the total for the country in 1923.

Since Sept. 22, 1922, the manganese content, not the gross weight, of ores imported, and apparently the values of the ores, has been recorded. The estimated manganese content of manganese ore imported is reported by the Bureau of Foreign and Domestic Commerce to have been 236,635 tons during the first 11 months of 1924 (January to November inclusive), compared with 206,048 tons in 1923. Assuming an average manganese content of manganese ore imported of approximately 48-50 per cent, the imports of ore during these periods were about 473,000 tons for 11 months in 1924, and 412,000 tons for 1923. The value of the imports is given as $5,505,658 for the first 11 months of 1924, and $3,874,510 for 1923.

The shipments of domestic ore containing 10 to 35 per cent of manganese in 1924 dropped to 280,000 tons from 319,666 tons in 1923. Shipments of ore containing 5 to 10 per cent manganese dropped to 585,000 gross tons in 1924 from 1,072,457 tons in 1923.

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The Pacific Gas & Electric Co., San Francisco, has made public a development program calling for a total expenditure of $33,721,000, of which $17,821,000 is budgeted for expenditure in 1925.

# Steel Makers Lose in Assigned Car Case

## Decision of Majority of Interstate Commerce Commission Vigorously Attacked by Dissenting Opinions—Action Declared Destructive Attack on Industry

WASHINGTON, Jan. 13.—Iron and steel, by-product coking, coal, and railroad interests along with others owning private railroad cars lost their contentions in the assigned car case when final decision in the proceeding was announced yesterday by the Interstate Commerce Commission. In a divided vote of the commission the majority reaffirmed its previous finding and held that the practice of railroads in assigning private cars and railroad cars to bituminous coal mines in excess of the ratable share to mines not receiving assigned cars is unjust and unreasonable and unjustly discriminatory to mines not receiving assigned cars.

The effect of the decision will be to permit the assigning of private cars owned by the steel and by-product and other interests to mines which heretofore have not received them and in such instances to take control of the cars out of the hands of their owners. The commission had postponed the effective date of the original order as to hearing additional testimony, but in the decision yesterday made March 1, 1925, the effective date.

### May Appeal to Supreme Court

The majority opinion was written by Commissioner Aitchison. Dissents were made by Commissioners Potter, Cox and Hall. It is believed that the case will be appealed to the Supreme Court of the United States. But before it can be taken up, the marked change in the distribution of cars and rules of the railroads in assigning them will have gone into effect. It was proposed by the respondents that assigned cars, including those for railroad fuel and private cars, must be placed at coal mines to which assigned and that if the cars thus placed at a mine should equal or exceed the mine's pro rata share of the available car supply for that day, it should not be entitled to any unassigned cars; but that if the number of assigned cars placed at the mine should be less than its pro rata share for that day it should be given enough unassigned cars in addition to its assigned cars to make up its pro rata share. The commission, however, requires the carriers to abolish the assigned car rule. Companies owning on Oct. 1, 1923, about 21,000 of the total 29,296 coal and coke cars privately owned claimed the right to place such cars without restriction at designated mines unless this resulted in preferential use of other equipment and that the commission had no authority to abolish the assigned-car rule and require pro rata distribution. Among these companies and the number of cars they own were the Carnegie Steel Co. and other Steel Corporation subsidiaries, 5200; Bethlehem Steel Corporation, 3975; Youngstown Sheet & Tube Co., 1334; Seaboard By-Product Co., 350; Chicago By-Product Coke Co., 650; Berwind-White Coal Mining Co. and subsidiary company, 4078; Donner Union Coke Corporation, 500; Rainey-Wood Co., 400; Westmoreland Coal Co., 2019; International Harvester Co. and subsidiary, 500; Ford Motor Co. and subsidiary company, 800; Pittsburgh Plate Glass Co., 269, and Steel Company of Canada and affiliated companies, 400.

### *Different Conclusions Reached*

Both the majority and the minority decisions describe the technical processes involved in the making of by-product coke and the necessity of having a regular supply of coal of proper quality for coking purposes in connection with the manufacture of iron and steel, gas, etc. These processes were described at the hearings by such men as Chairman Charles M. Schwab of the Bethlehem Steel Corporation, President James A. Campbell, Youngstown Sheet & Tube Co., representatives of coking interests, and others. Details as to production of coal, coke, and by-products by the interested companies, previously set forth by THE IRON AGE, are stated. But far different conclusions are reached by the majority and minority members. The majority, for example, points out that it is not intended that the finding "shall preclude the commission hereafter, in proper cases, in the exercise of the emergency powers conferred upon it . . . from requiring the placement of cars for bituminous coal loading at any mine or mines in excess of the current percentage allotment made to mines generally upon the lines of the same carrier, or upon the same division, when the order or direction for placement shall so provide."

### Defends Private Car

In his vigorous dissent, Commissioner Potter, among other things, points out the importance of the use of the private car as essential to certain lines of industrial development, and particularly to the by-product coking industry "and ramifications thereof." He declared that the effect of the majority report "will attack in a most disastrous way a vast and growing industry based upon the by-product coking process which is perhaps the most glorious achievement of this country along scientific lines." In emphasizing the necessity of private cars so as to get the proper quality of coal for coking purposes, Commissioner Potter says that the past has demonstrated that this kind of coal cannot be secured alone in system cars during periods of car shortage. As the use of steel making continues to develop, he points out, the necessity for selecting special coals will increase. One of the greatest economic developments in the steel industry during the past 20 years, says Commissioner Potter, has been the utilization of by-products of coking coal and he takes occasion to state that continuous operation of by-product ovens is necessary in furnishing gas to municipalities, etc., and that this in turn is dependent upon a continuous and adequate supply of the proper kind of coal. He expresses surprise that testimony along this line by Mr. Schwab and others did not make a strong impression on the majority. At one point, Commissioner Potter says:

### Great Damage to By-Product Industry

"The aggressive and destructive attack which the majority report is upon the by-product coking industry, retarding advance in the art of steel making and utilization of coal-tar products, is timely for the nation's rivals. The producers of Germany, and other European countries, are consolidating their position to take control of world markets, including our own, and to meet our growing rivalry. The phenomenal development of the coal-tar industry in this country since the beginning of the World War has been well said to be 'one of the romances of American business, and world business as well.' The American dye industry is an illustration, but dyes are only one of many coal-tar products. Others include roofing and road material, fertilizers, ammonia, benzol, motor benzol, toluol, naphtha, benzine, toluene, naphthalene, photographic materials, medicines, perfumes, flavors, and articles too numerous to mention.

"The majority report gives this industry the most serious and alarming setback it has ever had. It is the greatest benefit that could be conferred upon our foreign competitors in science and industry. The one thing above all others they would have us do is to abolish the use of the private car. I can see no justification or excuse for the damage done. The private car, without adding a penny to the general burden, increases transportation facilities generally available. Its owners provide for themselves additional cars with-

out which they would be entitled to share in the distribution of all other equipment. It is undeniable that those who oppose their use are benefited by them. To bar them serves only to foster private greed and envy at the expense of public welfare."

**President Coolidge Quoted**

Commissioner Cox, in his dissent, said that perhaps no question which has come before the commission in recent years is more closely related to the industrial life of the nation than the present one.

"President Coolidge has emphasized the need for elimination of waste and there is splendid opportunity for cooperation along these lines in the production and distribution of coal," he says. "Our position in connection with the competitive markets of the world also emphasizes the need for such cooperation. It is my thought that the use of the assigned cars as well as private cars is along the line of efficiency and economy of operation. They both occupy an important place in the field of transportation and their use should be encouraged rather than condemned."

## MINOR CHANGES PROPOSED

### Iron and Steel Scrap Specifications Considered at Washington Meeting

WASHINGTON, Jan. 13.—Comparatively minor revisions in iron and steel scrap specifications prepared by the National Association of Purchasing Agents were recommended yesterday at a meeting at the Bureau of Standards. One of the outstanding changes in recommendations was the adoption of a paragraph under the No. 1 heavy melting steel classification excluding alloy steel scrap from the specifications through mutual agreement between buyers and sellers. Another change set up a separate paragraph covering No. 1 selected shearing scrap which was added to the selected rail scrap specification. Changes also were made in the minimum and maximum weights and dimensions of basic open-hearth scrap, including No. 1 and No. 2 busheling, No. 1 selected rail scrap and No. 1, No. 2 and No. 3 cast iron scrap. These revisions increase both weights and sizes in some cases. A separate class was set up for girder rails which had been included with T and guard rails. Changes to 0.50 per cent were made in the silicon content for scrap low in phosphorus and sulphur. According to the recommendations, alloy steel scrap may be excluded from scrap specifications for use in electric furnaces by mutual agreement between buyers and sellers. Some changes were also made in weights in the latter classification. Other recommendations chiefly concerned phraseology.

The meeting was presided over by Dr. H. W. Gillett, chief of the Divisicn of Metallurgy of the bureau and was attended by approximately 20 representatives of the National Association of Purchasing Agents, railroads, iron and steel works, and the Federal Specifications Board. The recommended changes will be reported to the annual meeting of the National Association of Purchasing Agents at Milwaukee, May 25-28.

The proposed specifications were published in THE IRON AGE of Jan. 8.

## LABOR COST HIGH

### Declared to Average 80 Per Cent of Wholesale Prices After Thorough Investigation

Most industries have accurate information regarding direct labor costs, but little has been published regarding cumulative labor charges from the raw materials in the ground and the crops in the field to the finished products. A study of this subject indicates that the general average total labor cost content in wholesale prices of a great variety of commodities is approximately 80 per cent.

The investigation was conducted by W. H. Manss, now president Williams Alloy Products Co., manufacturer of pistons, rings and bearings, with offices at Chicago and plant at Elyria, Ohio. Mr. Manss, until 1917, was assistant to the vice-president, Baltimore & Ohio Railroad, in charge of industrial and agricultural development work. He was then a member of the War Industries Board as director of War Service Committees in connection with the mobilization of industries for war purposes. This brought him into unusually close relations with a great diversity of industries throughout the country. In 1920 he became associated with the International Harvester Co. at Chicago as executive representative. Altogether, his past experience embraces connections with several railroads, industries owning coal and iron mines, steel mills, lumber mills and manufacturers of various finished products. He has also sat in councils of agricultural interest and has held hearings on transportation, marketing and distribution for a congressional committee.

With this background he set to work to ascertain some of the elements of cost, especially the accumulative labor content cost in finished products. More than three years were spent in studies, research, correspondence, conferences with industries and economists to check and recheck labor costs from the raw materials in the ground, crops in the fields, through the manufacturing processes to the finished articles, with a view of obtaining the cumulative, not the direct, labor percentages in the wholesale prices of various commodities.

The results of his work are presented in the following percentages of accumulative labor cost content in wholesale prices:

| *Basic Materials* | Per Cent |
|---|---|
| Coal | 79 |
| Coke | 80 |
| Lumber | 79 |
| Steel | 85 |
| Pig iron | 86½ |
| St. castings | 86 |
| Leather | 78 |
| Paint | 72 |
| Average | 81 |

| *Agriculture* | |
|---|---|
| Crops | 70 |
| Truck | 78 |
| Fruit | 70 |
| Animal | 76 |
| Butter | 82 |
| Average | 75 |

| *Miscellaneous* | |
|---|---|
| Railroads | 81.8 |
| Building | 80 |
| Motor trucks | 82 |
| Motor cycles | 80 |
| Average | 81 |

| *Manufactured Products* | Per Cent |
|---|---|
| Barbed wire | 86 |
| Locomotives | 85 |
| Railway cars | 78 |
| Book paper | 78 |
| Radiators | 84 |
| Hardware | 82 |
| Shoes | 80 |
| Men's clothing | 79 |
| Elec. machinery | 80½ |
| All machinery | 84 |
| Plate glass | 85 |
| Copper | 84 |
| Furniture | 85 |
| Agr. implements | 82 |
| Woolen textiles | 80 |
| Adding machine | 84 |
| Pianos | 82 |
| Average | 82.2 |

*General Average 79.9 Per Cent*

The labor content in taxes, insurance, banking, etc., have not been ascertainable.

Distribution of percentages to wholesale prices could be regarded as follows:

| | Per Cent |
|---|---|
| To labor | 80 |
| To taxes and insurance | 3 |
| To depreciation and rentals | 2 |
| To interest | 2 |
| To profit on raw and semi-finished materials | 3 |
| To miscellaneous, losses, distribution service | 4 |
| To profit—finished products | 6 |
| Wholesale selling price | 100 |

New Year's day and the fact that three factories were closed for inventory are given as the reason for a sharp slump in industrial activity in Bridgeport in the week ended Jan. 3. The number of employees was 11,948, or 47.2 per cent of the capacity of the 31 plants which are members of the Manufacturers' Association. The average hours worked per employee were 30.3, the number of man-hours being reported at 362,569, or 29.2 per cent of capacity. The average factory hours were given as 34.1, or 69.6 per cent of normal.

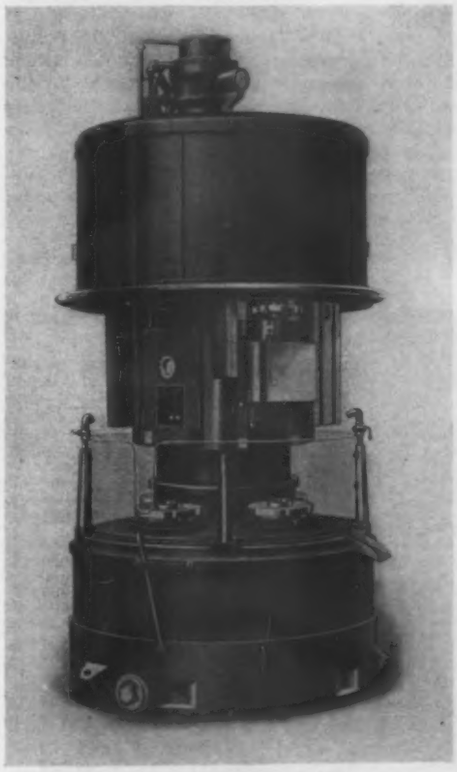
# FOUR-SPINDLE MULT-AU-MATIC

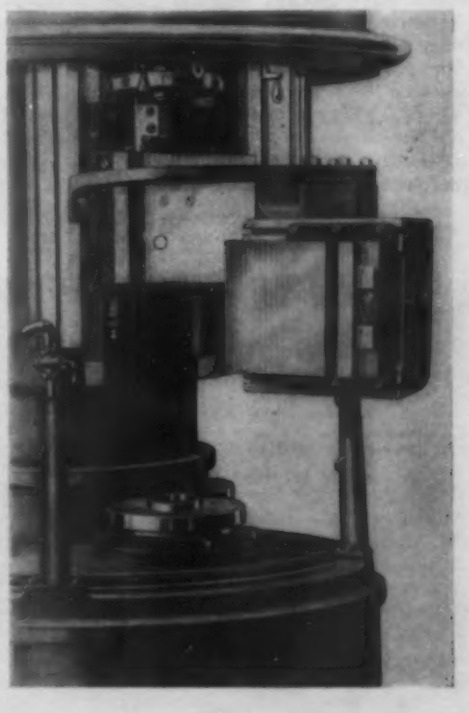
## Retains Features of Six-Spindle Machine—Side Heads Increase Tooling Capacity

The Bullard Machine Tool Co., Bridgeport, Conn., has placed on the market a four-spindle Mult-Au-Matic, the construction of which is similar to its standard six-spindle machine of the same name. The principles of operation and sequence of functions are the same in both machines. The new machine, which is illustrated herewith, is available at present in the 8-in. size.

The Mult-Au-Matic machines are designed for high output of chucked work, the four-spindle unit being intended for the intermediate ranges of quantity production, where the volume required does not justify the installation of the larger six-spindle machine. Economy of investment, floor space, power, tooling and maintenance are claimed for both machines.

In the four-spindle machine the fewer working units available restrict the variety of operations which may be accomplished, and this lengthens proportionately the production time for any piece, as compared with the larger machine. Automatic mechanical control of all operating functions has been retained, and the design provides for independent setting of speeds and feeds for each of the working stations.





Four-Spindle Mult-Au-Matic for Quantity Production of Chucked Work. The design follows that of the company's six-spindle machine. The fewer working units restrict the variety of operations accomplished in one chucking and lengthen proportionately the production time for any one piece, as compared on the two machines. Automatic mechanical control of all operating functions is incorporated, and independent setting of speeds and feeds for each station is provided. The supplementary side head, shown at the right, may be applied to any or all of the three working stations, providing tooling capacity of six separate heads if required

The machine is made up of four individual production units under automatic centralized control with four work-holding spindles mounted in the carrier and four stations provided about the central column for processing the work. The first station is without tools, permitting the unloading of finished work and chucking of the rough piece. The remaining stations are equipped with universal tool-carrying heads which may be set independently in rate of speed and in direction, amount and rate of feed to suit the requirements of the work to be performed at each station.

A supplementary side head is available for use where the tooling capacity of the three main heads is not sufficient. Provision is made on the supporting column for the application of this unit at any or all of the three working stations, giving the tooling capacity of six separate heads in the machining of any piece, if required. This side head unit, which is shown in the separate illustration, is mounted on a bearing provided on the central column and is braced by an arm which extends across the column face. Standard or special tool holders may be clamped to the face of the tool slide. Vertical adjustment on the side head is permanently set by hand to suit each job, and horizontal, vertical, or angular cuts may be taken. The amount of traverse of the side head may be variably set between 3 and 6 in. The total distance is made of components of rapid traverse and feed, the proportions and rate of which are in direct relation to the main head at the same station.

The cycle of operating functions begins with the indexing of the carrier and a presentation of new work at each station. All tool heads advance rapidly to the point of cutting at a rate which is constant and bears no relation to the feed. At a predetermined point, the rapid traverse is stopped and the feed motion is engaged. When the cutting is completed, the tools and head are withdrawn under rapid traverse. As the last head to complete its work returns, the indexing mechanism is tripped automatically and the cycle is repeated. The production time of a single piece is limited only by the time of the longest single operation.

The capacity of the machine is for work 8 in. in diameter and 6 in. in height. The spindle head is 9¾ in. in diameter and the standard chuck, which is of the three-jaw universal type, is 10 in. in diameter. The spindle speeds range from 33 to 300 r.p.m. and are set independently for each station. The movement of the main heads is 6 in. vertical and 3 in. horizontal or angular. The vertical feed may be used only for the main head at those stations where the supplementary side head is attached. The maximum movement of the supplementary heads is 3 in. in vertical, horizontal or angular directions. The rates of feed of the main heads vary from 0.0067 to 0.060 in. A 7½-h.p. 1200-r.p.m. constant-speed drive motor is employed. The diameter of the base is 67 in. and the height of the machine is 128 in.

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Fire partially damaged the plant of the Petroleum Iron Works Co., Sharon, Pa., Jan. 9, with a loss of $10,000. Operations were suspended for two days, while repairs were made.

# MORE MACHINE SHOP OUTPUT

## Production of Foundries and Machine Shops in 1923 One-Half Greater Than in 1921

Products to the value of $2,337,807,997 were turned out in 1923 by 8532 establishments, whose work primarily was the manufacture of foundry and machine shop products, according to the United States Census Bureau. This is an increase of 49.3 per cent over the $1,565,526,944 output of 9013 establishments in 1921. The output was grouped under four headings: boiler shops, foundries, machine shops and a combination of machine shops and foundries together. Each of these four groups showed a substantial increase in output, though in varying degree, the machine shops alone recording only 29.8 per cent, while the machine shops and foundries combined showed 101.5 per cent.

Wage earners increased 39.7 per cent from 321,363 to 449,040 and there was much greater stability as shown by uniformity of employment. In 1921, the minimum month, with 291,712 wage earners, gave only 76 per cent of the number in the maximum month, when there were 384,084 employed. In 1923, on the other hand, the spread between maximum and minimum was only about 50,000 employees, compared with 92,000 in the earlier year; the minimum month with 420,115 showed 89.3 per cent of the maximum month with 470,532. Wages increased in a larger percentage than did the number of wage earners, for the $412,359,408 of 1921 gave place to $642,649,017 in 1923, a gain of 55.8 per cent. The average wages during the year per wage earner employed increased from $1,283 in 1921 to $1,431 in 1923. The horsepower used in 1923 was 1,233,894 and the coal consumed 4,494,354 net tons.

Attention is called in the report to the fact that the classification does not cover all establishments using foundry and machine shop processes. It eliminates, among others, the manufacturers of agricultural implements, automobiles, cast iron pipe, electrical apparatus, engines, locomotives, machine tools, textile machinery, stoves and furnaces and many other specific products which the Census Bureau reports individually. The figures here cover the many foundries and machine shops which make so great a variety of products that they cannot be properly assigned to specific industry classifications. They cover also all of the jobbing shops. Details of the output of the several groups in the two years are shown in the table:

| | 1923 | 1921 | Percentage of Increase |
|---|---|---|---|
| Boiler shops | $124,691,231 | $89,203,488 | 39.8 |
| Machine shops | 1,280,382,726 | 986,698,366 | 29.8 |
| Machine shops and foundries combined | 578,026,024 | 286,892,275 | 101.5 |
| Foundries | 354,708,016 | 202,732,815 | 75.0 |
| Steel castings | 37,638,766 | Not reported separately | |
| Malleable iron castings | 117,386,866 | Not reported separately | |
| Gray iron castings | 154,928,816 | Not reported separately | |
| All other castings | 44,753,568 | Not reported separately | |

It should be noted in connection with the values given for different grades of castings that the items represent the total values of products reported by the establishments engaged primarily in manufacturing the specified classes of castings. As some establishments manufacture more than one class of castings, the figures do not represent exactly the values of the several kinds of castings listed, but they form the nearest approximation available.

# LESS IRON ORE PRODUCED

## 1924 Mining Output 22 Per Cent Below 1923 and Value of Ore Shipped 37 Per Cent Under the Previous Year

Iron ore mined in the United States in 1924 is estimated by the Geological Survey to have amounted to 54,021,000 gross tons, compared with 69,351,442 tons mined in 1923. Except for the Western States and the States of Alabama and Missouri, every district showed a decrease. This was most pronounced in the Lake Superior district, where the 59,394,180 tons of 1923 shrank to 44,862,000 tons in 1924, and in the Northeastern States, where 1,843,096 tons was reduced to 1,097,000 tons. The Southeastern States, with 7,320,000 tons in 1924, showed a loss of less than 2 per cent from the 7,436,949 tons of 1923, the smallness of the drop being due largely to a slight increase in Alabama, which furnished the bulk of the output of that section, and to a proportionally heavy increase, although small in tonnage, from Missouri. The Western States, with 742,000 tons in 1924, against 677,217 tons in 1923, recorded a gain of nearly 10 per cent.

Shipments from the mines in 1924 are estimated at slightly lower than the amount of ore mined, being given at 51,996,000 tons, compared with 69,811,472 tons in 1923, a decrease of 26 per cent. In value, this decrease was still greater because of a shrinkage in average ore value at the mines from $3.45 to $2.91 per gross ton. The figures are given as $151,385,000 in 1924, compared with $240,738,921 in 1923

### Imports and Exports

Imports of iron ore for the first 11 months of 1924 are given at 1,861,480 gross tons, valued at $9,656,087, or $5.19 per ton, which is higher than seems consistent with values of domestic ores. Exports in the same 11 months were 585,960 tons, valued at $2,360,968, or $4.03 per ton. For the 12 months of 1923 imports were 2,768,399 gross tons, valued at $11,304,737, or $4.08 a ton, while exports for the same year were 1,116,932 tons, valued at $5,305,365, or $4.75 per ton. Net imports in 11 months of 1924 thus amounted to 1,275,520 gross tons. If December shows the same amount of imports as November (about 220,000 tons) this will mean less than 1,500,000 tons net imports for the year, which is below 3 per cent of the figure for production.

Detailed figures of production by States are shown in the table.

| District | Ore Mined (Gross Tons) 1923 | 1924 |
|---|---|---|
| Lake Superior: | | |
| Michigan | 14,174,468 | 12,333,000 |
| Minnesota | 44,348,296 | 31,837,000 |
| Wisconsin | 871,416 | 692,000 |
| | 59,394,180 | 44,862,000 |
| Southeastern States: | | |
| Alabama | 6,783,146 | 6,842,000 |
| Georgia | 117,321 | 116,000 |
| Missouri | 53,546 | 86,000 |
| North Carolina | 59,684 | 11,000 |
| Tennessee | 267,275 | 187,000 |
| Virginia | 155,977 | 78,000 |
| | 7,436,949 | 7,320,000 |
| Northeastern States: | | |
| New Jersey | 307,733 | 65,000 |
| New York | 541,922 | 250,000 |
| Pennsylvania | 993,441 | 782,000 |
| | 1,843,096 | 1,097,000 |
| Western States | 677,217 | 742,000 |
| Grand Total | 69,351,442 | 54,021,000 |

## Better Position of American Machinery Exports

American machinery is reported as stronger in the world's markets than ever before, according to the industrial machinery division of the Department of Commerce. Data from Japan and Italy in particular are given as indicating the strength of the American machinery maker in his export business. It is pointed out that, while Great Britain furnished over two-thirds of the machinery imported by Japan in 1910, her best record since the war was 41 per cent in 1921. In 1921 the United States furnished more than 41 per cent of Japan's machinery imports, against less than 20 per cent in the pre-war period.

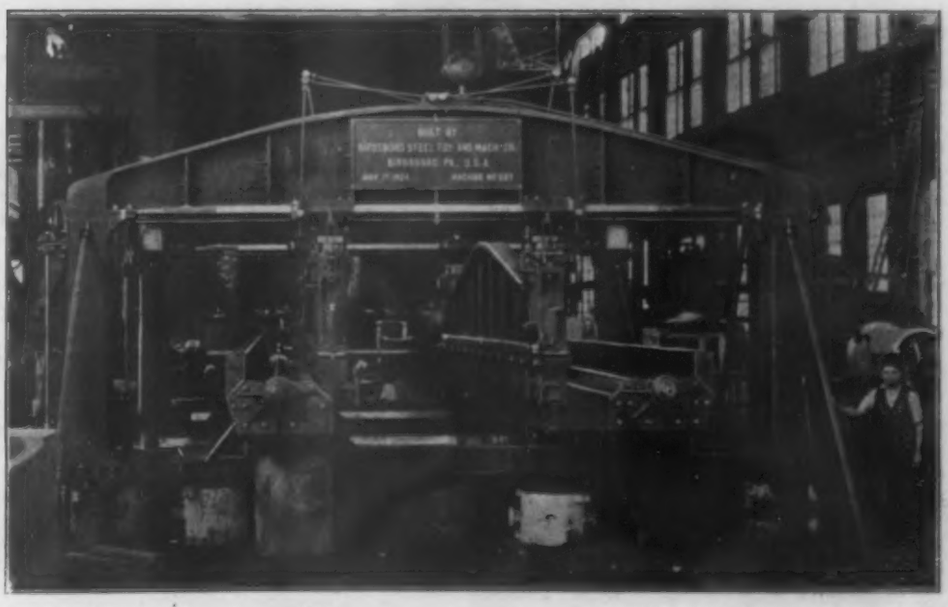
Bituminous coal produced in the United States in the week ended Jan. 3 is estimated by the Geological Survey at 10,591,000 net tons. An increase over the 9,368,000 tons of last year, but a decrease from the 11,371,000 tons of the same week in 1923. Some of the mines were operating on New Year's day, although approximately 70 per cent of the units were idle.

# MACHINE FOR PLATE WORK

## Special Unit Planes and Upsets Edges of Plates Used in Making Lock Bar Pipe

A special machine for planing and upsetting the edges of plates used in the manufacture of the lock bar pipe made by the Riter-Conley Co., and installed recently in the Leetsdale plant of that company, is shown in the accompanying illustrations.

Machine for Planing and Upsetting the Edges of Plates Used in Making Lock Bar Pipe. The plates usually are in 30 ft. lengths and of various widths. The machine is made up of two main beds carrying lead screws and carriages. Beams for clamping the plates are supported by the overhead crossbeams as shown. Entering and discharging of plates into machine is automatic



The Main Beds and Clamping Girders Are Adjustable Crosswise to Accommodate Plates of Various Widths. This adjustment is by four single-thread screws connected to a common shaft which is driven by motor. Individual adjustment at both ends of the machine is provided by means of two jaw clutches in the cross screw drive shaft

The procedure in making lock bar pipe, which derives its name from the bar which locks the plates together, forming the pipe, is to plane the edges of plates as received from the mill and to upset the edges by applying pressure by means of rollers. The plates are usually 30 ft. long. They are thereafter bent to the proper radius and the upset edges joined with a special rolled lock bar. This bar is pressed together over the upset edges, making a tight joint, which eliminates riveting and is claimed to be of the same strength as the plate.

The machine, which was built by the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., is made up of two main beds carrying the lead screws and carriages. Each side of the beds is formed into a beam on which the plates rest. Two heavy clamping beams 32-ft. long are supported above the bed beams, and serve to clamp the plates for the full length of the two edges that are to be planed and upset. The clamping is by means of hydraulic pressure of approximately 100,000 lb. applied at each end of the beams. Two overhead crossbeams, resting on the column as shown, support the clamping beams.

The lead screws are 6 in. in diameter and have a triple thread. They are connected by bevel gears to a common shaft, which is driven through a Falk reduction gear unit by a 200-hp. motor. Each carriage is equipped with a tool holder, which accommodates six cutting tools, and a holder for eight vertical upsetting rolls. Finished plates are pushed out of the machine by means of a push-out bar located in front of the carriage, and a clamping device is provided at the back of the carriage for gripping and moving plates into the machine.

The main beds and clamping girders are adjustable to accommodate plates varying in width from 30 in. to 12 ft. The main beds are mounted on five shoe plates provided with Tee-slots on which they can slide, and bolted after the adjustment has been made. The clamping beams have similar adjustment, being supported by and sliding on the lower flange of the overhead cross-beams. These adjustments are accomplished by means of four single thread screws, two of which are mounted below the main beds and two below the overhead cross girders. The four screws are connected by bevel gears to a common drive shaft, which is driven by a 10 hp. motor.

The two edges of the plates used in the lock bar pipe are not parallel, due to the fact that one end of the finished pipe section must be of smaller diameter than the other end, so that one section of pipe can fit into the other. It is required therefore, that the main beds and clamp girders of the machine have individual

adjustment at both ends. For this purpose the shaft driving the cross screws is provided with two jaw clutches, either of which may be operated individually, or both together. A differential limit switch serves to prevent overtravel of the machine beyond the limit of allowable misalinement, and as an additional safeguard, the drive gear has been made of the slip ring type, which slips under a heavy overload.

The main beds are 45 ft. long, and each bed is made in three sections. The sections have the ends planed and cross-keyed and are held together by heavy bolts. As the beds form the slide for the carriages, the joints had to be made so that the three sections were in close alinement. The planing of these sectional beds and joining them into a 45 ft. bed was a difficult shop operation. Because of the heavy loads encountered, the machine was constructed of steel throughout. Tests made at the builders plant revealed that a pressure of approximately 400,000 lb. was required to upset the edge of ½ in. plate. In addition to the side pressure on the main beds, there is considerable stress from the cutting tools, it being necessary sometimes to remove 2 in. of stock from each of the two edges of a plate, which is done by six cutting tools simultaneously with the upsetting.

Entering and discharging of the plates in the machine is accomplished automatically on the return stroke of the carriages. The speed of the carriages is from 25 to 35 ft. per min., depending upon the thickness of plates being upset. The plates enter the machine at one end, resting on a roller table and casters. Casters are also placed between the beds for support of the plates. After being finished the plates are pushed out of the machine onto another roller table, from which they are removed by an overhead magnet. A plate 30 ft. long is said to be planed and upset, removed from the machine and replaced with another in 2¾ min.

The carriage is provided with a platform on which the operator can ride. A rod extending along the side of the clamping beams, within easy reach, connects to the starting switch, permitting the operator to stop the carriage from any position.

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# Tremendous Saving by Standardization

## Assistant Director Brown of the Bureau of Standards Tells of Things Accomplished and of Possibilities

WASHINGTON, Jan. 12.—The great scientific value of the Bureau of Standards to industry and to the country as a whole long has been realized, at least partially, by those who are at all familiar with the real work of this bureau. But the estimate of the value of the bureau has been dealt with chiefly from a point of its work in developing science and in improving the quality of industrial production and other endeavors. All of this work performed by untiring and high-grade scientists inevitably means a practical humanitarianism. Its service to society cannot be stated in dollars and cents because the equation is much greater than that.

But it has remained for Dr. F. C. Brown, assistant director of the Bureau of Standards, to state in money values what the bureau means to the country. Dr. Brown declares that no less than $1,000,000,000 may be saved to the country annually through simplification work alone of the bureau.

"Standardization is not a fable," says Dr. Brown. "It has a meaning. Standardization is the key to civilization. It is just as unthinkable to have civilization without standards as it is to have a prosperous country populated entirely by the inmates of an insane asylum."

In pointing out some of the accomplishments of scientific work of the bureau, Dr. Brown referred, as an example, to improved brake linings for automobiles which resulted in a saving of $15,000,000 annually in the cost of brake linings. Using this example also to show that work of the bureau is not merely a benefit to the country's industries but to the people as a whole, Dr. Brown pointed out that it is easy to understand that the average pedestrian as well as the automobile driver has greater safety on the road as a result of better brake linings. The question as to who gets the $15,000,000, said Dr. Brown, has arisen particularly with regard to the saving of wastes and losses resulting from the deletion of excess varieties, grades and sizes of commodities found in commerce.

"Manufacturers have recognized the enormous economic waste of excess varieties and are most cordial in the support of the Department of Commerce in cooperating to eliminate unnecessary lines of commodities," said Dr. Brown. "They have agreed to cut 66 miscellaneous varieties of paving bricks to five sizes in common demand. Similarly, wire fence is reduced from 552 sizes to 69; beds from 78 to 4; building brick from 78 to 2; milk bottles from 49 to 9; hotel chinaware from 700 to 160; files and rasps from 1351 to 496, and so on. Building materials, plumbing supplies and hardware are all being reduced to the minimum number of best standards that are known. A billion dollars may be saved to the country annually through this simplification work alone."

A number of other examples of savings as a result of the work of the bureau were mentioned by Dr. Brown. One of them related to a new standard in the safety of elevators for which the bureau has good authority, Dr. Brown points out, for estimating an annual savings in insurance costs of $500,000. A new safety release device for use on tanks containing gases for shipment is another improvement which it was stated will produce an estimated saving of $250,000 a year.

"Very valuable contributions," it was declared by Dr. Brown, "have been made on the materials and members entering into huge structures. New strain gages have been devised to accomplish these results. The electrical strain gage, made of a pile of carbon disks, for the measurement of minute changes in the length of materials under varying loads, has already been used in airships in flight, in bridge structures and in structural test members in the two-million-pound testing machine, and is now to be used further in road and bridge testing and in the study of the behavior of unusual dams and towers where the loads bring on the breaking point. It is difficult to place the value on an instrument which makes possible better and safer design of huge structures and which saves thereby both money and human lives, but it is easy to believe that the added information has a potential value of hundreds of millions.

"In connection with building construction the work of the Building Code Committee, the Plumbing Committee and the Hardware Manufacturers' Committee should save hundreds of millions annually in the construction of dwellings and offices. For example, the investigation showed the 3-in. stack in plumbing to be equally satisfactory to the 4-in. stack now in general use. This fact alone will save a million dollars annually in small dwellings."

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Building permits issued in Cincinnati in 1924 showed a slump of over $2,000,000 as compared with 1923, the figures being $27,578,580 in 1924 as compared with $29,923,135 in 1923. Permits totaling nearly $6,000,000 were held up pending a decision on the validity of a zoning law established in May. These permits were later validated through a decision of the Supreme Court of Ohio, and several of the buildings for which they applied have been started.

# Research Method for Blast Furnaces

## Use of Symbols to Designate Observed Conditions Facilitates Work—Records Capable of Later Intimate Analysis

BY WALLACE G. IMHOFF AND DONALD E. ACKERMAN

ONE difficult problem in conducting research investigations on the blast furnace is the great number of facts which have to be observed and recorded, due to the large scale on which the practical operations are carried out. There are so many variables to be considered; the materials do not always show constant analysis; the apparatus is large and bulky and with no easily accessible way of determining accurately what is going on inside; the fuel changes from time to time in structure and composition; the methods of operation vary from plant to plant; in fact, the whole situation is nothing but a maze of variables, disorganized and seemingly unrelated—facts which bewilder and block almost every avenue to reliable scientific research investigation.

There is still another important phase which must be considered. This is the practical experience necessary to interpret intelligently the results of various operations, as they appear from day to day in blast furnace operation. The blast furnace laborer is, as a general rule, an uneducated foreigner. Even the blower usually is a man not interested in research investigation on the causes of irregularities and remedies for his troubles. He is more interested in having his furnace run smoothly and in making the kind of iron desired.

With the idea of straightening things out by organized research, a system was invented which, as it was used and developed served, first, to record the facts of blast furnace problems, and second, to arrange these facts in a quick, orderly, intelligent way, so that they could be easily read and understood at any later time. It was early realized that this must be done before any research investigations on blast furnace problems could be of value. The first difficulty was that of recording everything that went on. Realizing the utter hopelessness of trying to write things down, a set of symbols was devised to tell the story. At first there were only five symbols, then ten, then twenty and, finally, about a hundred.

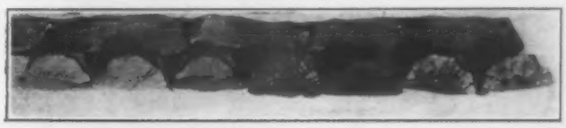


Fig. 1.—Iron Samples High in Sulphur. Note the arched tops, which are shown in the symbol of a shallow arch

Fig. 2.—Very Heavy Lime; Furnace Starting to Go Cold. Sulphur still in the combined form, as seen from the tops of the iron samples. Basic iron made on a "hot lime" furnace. The top is shown by the symbols 1 (c) and 9 (g)

Fig. 3.—High Sulphur Iron. The top is shown by the Symbols 1 (c) and 9 (e)

Fig. 4.—Smoke from the Slag Runner Represented by Symbol 2 (c). Lots of smoke would be symbol 2 (a)

### Development of the Symbols

These symbols were developed in a logical manner and in such a way that the smallest degree of difference could be recorded. For example, the top of the slag sample was carefully observed and, as seen in Fig. 9, the middle sample would be represented by ⌒ (an arch). If the sample top were flat, or level, it would then be represented by — (a straight line), or if deeply sagged it would be represented by ⌣

(a concave line). It is readily seen now that all kinds of slag tops can be designated simply by varying the degree of curvature of the line convexly or concavely to the degree that is found in the actual slag sample.

Let us take another example: suppose we wish to know how hot the slag was. A cold slag is represented by the symbol —— ; a hot slag by the symbol ; a medium hot slag by the symbol . The idea as to how the symbol employed will quickly show every degree of temperature is at once grasped.

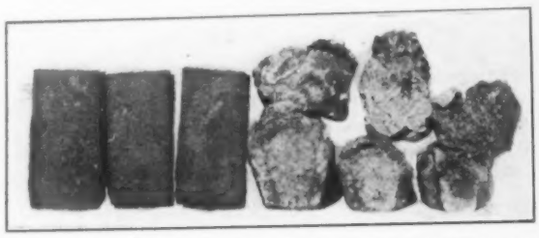


Fig. 5.—Top of Iron Samples. These tops would be represented by the symbols 1 (c) and 9 (a)

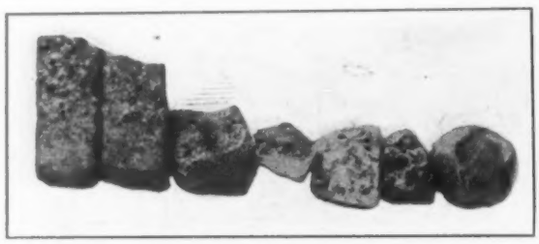


Fig. 6.—Foundry Iron and Slag. Low silica in slag, therefore tendency to be dry and grainy. Note the high rugged tops of the iron samples, which are represented by the symbols 1 (a) and 19 (a)

Fig. 7.—Various Slag Types Taken Under Different Furnace Conditions. The second sample from the right end shows hot lime; the first sample cold lime. The color of the first is shown by the symbol 7 (f); the color of the second by the symbol 7 (d)

Fig. 8.—Gas Cavities Represented by the Symbol 8 (a). The variation from a stony cinder to a porous cinder is shown by the number of the circles in the graphic symbol

Thus, by adding lines against the base every degree of heat may be represented.

One more slag characteristic shows how easy it is to record the exact conditions present when the iron was made. Some slags are thick, mucky, and will not run; others are thin, watery, and almost squirt from the cinder notch. By representing the thick slags with ——→ and the thin slags with →→→→ it is easy to see at a glance just how fluid the slag was when it ran from the furnace.

The test of the value of anything is found when it is employed under practical conditions. Gradually, as more and more characteristics of the iron, slag and furnace conditions were observed, more symbols were developed to meet the new demands, until finally all the conditions were represented by symbols and the complete performance of the furnace from one cast to the next could be recorded with little effort and in a small space. In reality, a shorthand system had been thus developed for carrying out blast furnace research.

Fig. 6 shows the high, rugged tops of foundry iron samples. They resemble a mountain range and are represented by the symbol ⩘. Fig. 4 shows the fog or smoke which often rises from the slag runner as the slag is drained at flush time. When there is no smoke from the runner the symbol is Ω. (Note that this symbol was developed from the roll seen on clouds of smoke.) When the smoke is very thick, the symbol is All degrees of smoke in between may be represented by the number of rolls in the symbol. Fig. 8 shows the gas cavities that sometimes occur in slags. A large number of gas cavities would be represented by the symbol ; a solid or stony cinder would be shown by the symbol o. All stages between a stony cinder and a porous, spongy cinder can thus

Fig. 9.—The Arched Top of the Middle Slag Sample Shows How the Symbols Were Derived, and How They Accurately Describe the Condition of the Slag Sample. These are very hot foundry iron slags. This top is shown by the symbol 9 (a)

Fig. 10.—Slag Sample Tops. The top of the second sample from the right end is represented by the symbols 9 (e) and 24 (g)

Fig. 11.—Snailshell-like Slags. These are hot bottom, cold air slags. The appearance is caused by the escaping gases from the slag, making it creep into this form. These slags are shown by the symbol 11 (a)

Fig. 12.—Slag Dipper Crusts. On the left a few gas cavities, sulphur combined; on the right free sulphur and lots of gas cavities. Those on the left would be shown by the symbol 25 (a); those on the right by the symbol 25 d)

*Table I.*—IRON CODE

Symbols Illustrating Iron Characteristics

1. Relief (Iron top) (Solid).
   - (a) High, rugged top
   - (b) Medium rugged top
   - (c) Level top
   - (d) Low concave top
2. Thick or Thin Iron (Fluidity).
   - (a) Thick
   - (b) Medium
   - (c) Thin
3. Solidifies (Freezes).
   - (a) Quickly
   - (b) Medium slowly
   - (c) Slowly
4. Iron Scrap Left in Runner. (Solid).
   - (a) High
   - (b) Medium
   - (c) Low
5. Temperature. (Molten).
   - (a) Hot
   - (b) Medium
   - (c) Cold
6. Characteristic Features Caused by Sulphur
   - (a) Pentagons (Molten)
   - (b) Chains (Molten)
   - (c) Dull disks (Molten)
   - (d) Pinheads (Molten)
   - (e) Suns (Molten)
   - (f) Stars (Molten)
   - (g) Dots (Eyes) (Molten)
   - (h) Shadows (Molten)
   - (i) Quiver (Molten)
   - (j) Grease spots (Solid)
   - (k) Hump (Solid)
   - (l) Wink (Molten)
   - (m) Circles (Molten)
   - (n) Pearlite (Molten)
7. Grain of Iron Samples (Cold)
   - (a) Coarse
   - (b) Medium
   - (c) Fine
8. Quantity of Sulphur Indicated by Top of Cold Sample and in Hot Molten Iron.

   | | Cold | Molten |
   |---|---|---|
   | (a) High | | |
   | (b) Medium | | |
   | (c) Low | | |

9. Characteristics of Iron Sample Top (Cold) and Molten Iron.
   - (a) Level, smooth (Cold)
   - (b) Level, rough (Cold)
   - (c) Spots, small (Cold)
   - (d) Spots, large (Cold)
   - (e) Pitted (Cold)
   - (f) Grease (Cold)
   - (g) Ragged (Lime) (Cold)
   - (h) Clear (Wet like water) (Molten)
   - (i) Dull (Molten)
   - (j) Rough (Cold)
10. Hot Iron.
    - (a) Boiling
    - (b) Curdle
    - (c) Coke mess
11. Black Deposit on Sample When Cooling.
    - (a) Black
    - (b) Medium
    - (c) Little
12. Crystal Clear. (Watery)
    - (a) Clear (Molten)
    - (b) Medium (Molten)
    - (c) Little (Molten)
    - (d) Dull (Molten)
13. Sparks at Tap Hole.
    1. Sulphur.
       - (a) Lots
       - (b) Medium
       - (c) Few
    2. Lime.
       - (a) Lots
       - (b) Medium
       - (c) Few
14. Grease.
    - (a) Lots
    - (b) Medium
    - (c) Little
15. Skull Left in Iron Sample Dipper.
    - (a) Mushy iron
    - (b) Medium thin
    - (c) Thin iron
16. Runner Sparks.
    - (a) Lots
    - (b) Medium
    - (c) Few
17. Buckshot.
    - (a) Lots
    - (b) Medium
    - (c) Little
18. Quiver. (Molten iron).
    - (a) Lots
    - (b) Medium
    - (c) Little
19. Craters. (Solid iron).
    - (a) Many
    - (b) Medium
    - (c) Few
20. Special Characteristics During Casting.
    - (a) Black flames (Tap hole)
    - (b) Purple flames (Tap hole)
    - (c) Yellow flames (Tap hole)
    - (d) Purple color
    - (e) Shiny
    - (f) Clear
    - (g) Cloudy
    - (h) Graphite
    - (i) Quicksilver
    - (j) Boils
    - (k) Grease balls
    - (l) Coke mess
    - (m) High free carbon
    - (n) Sulphur
21. Quantity of Iron.
    - (a) Ladles of iron
    - (b) Beds of iron
22. Tap Hole Flame.
    - (a) Black
    - (b) Yellow
    - (c) Purple
    - (d) White

be represented easily and quickly by adding circles; for example, .

Fig. 5 is another illustration of the iron sample top symbol; this top would be shown by the symbol —, meaning a perfectly flat, level top. Fig. 7 shows a number of slag samples. The first color, which is black, is represented by the symbol ■; the second, which is white, by the symbol □. All degrees of black and white may be quickly and easily shown, as well as all the other colors, by varying the symbols as shown in the complete symbol code.

Enough examples of the symbol code have been illustrated and described so that we will now consider

*Table II.*—SLAG CODE

Symbols Illustrating Slag Characteristics

1. Heat (Temperature of Slag).
   - (a) White hot
   - (b) Hot
   - (c) Medium
   - (d) Cold
   - (e) Very cold

2. Fume (from Slag Runner).
   - (a) Lots
   - (b) Medium
   - (c) Little
   - (d) None

3. Sulphur Smell.
   - (a) Strong
   - (b) Medium
   - (c) Weak

4. Slag Runs:
   - (a) Fast
   - (b) Medium
   - (c) Slow

5. Thickness.
   - (a) Mucky
   - (b) Medium
   - (c) Thin

6. Kind of Slag.
   - (a) Basic
   - (b) Between
   - (c) Acid

7. Color of Fracture.
   - (a) Dark gray
   - (b) Gray
   - (c) Yellow
   - (d) White
   - (e) Blue
   - (f) Black
   - (g) Brown
   - (h) Green
   - (i) Medium black

8. Gas Cavities.

| | Lime | Sulphur |
|---|---|---|
| (a) Lots | | |
| (b) Medium | | |
| (c) Few | | |
| (d) None | | |

9. Relief.
   - (a) High
   - (b) Medium
   - (c) Low

10. Top.
    - (a) White
    - (b) Medium
    - (c) Dark
    - (d) Black
    - (e) Hot white
    - (f) Sulphur
    - (g) Green

11. Creep.
    - (a) Lots
    - (b) Medium
    - (c) Little

12. Drop from Dipper.
    - (a) Cuts short
    - (b) Medium
    - (c) Thread

13. Eyes.
    - (a) Lots
    - (b) Medium
    - (c) Few
    - (d) Crusty
    - (e) Shadows
    - (f) Purple iron balls
    - (g) Lime (yellow) iron balls

Warts.

Smooth —

14. Slag Runner.
    - (a) Big
    - (b) Medium
    - (c) Small

15. Cross Section of Slag Runner.
    - (a)
    - (b)
    - (c)

16. Gas Flames.
    - (a) Big
    - (b) Medium
    - (c) Little
    - (d) None

17. Foam.
    - (a) Greasy
    - (b) Foamy
    - (c) Medium
    - (d) Dense
    - (e) Scummy
    - (f) Spits
    - (g) Dry
    - (h) Mucky

18. Lime.
    - (a) Very limey
    - (b) Limey (good)
    - (c) Medium; shows silica
    - (d) Lean
    - (e) Glass
    - (f) Glass cold, sparks
    - (g) Slacks
    - (h) Earthy
    - (i) Sparks (lime)
    - (j) Mucky lime

19. Mold (Slag Sample Box).
    - (a) Sample sticks
    - (b) Comes out medium easy
    - (c) Drops out easy

20. Chemical Indications.
    1. (a) White smoke (CaS)
       - (b) Between
       - (c) Silicate slag
       - (d) Glass (silica)
    2. Iron Shot.
       - (a) Lots
       - (b) Medium
       - (c) Little
       - (d) None

21. Density of Slag Sample.
    - (a) Solid
    - (b) Medium
    - (c) Scoria
    - (d) Stony
    - (e) Grainy
    - (f) Glassy
    - (g) Lean
    - (h) Cavities

22. Relative Heat (Temperature of Slag).
    - (a) Hotter than last
    - (b) Same as last
    - (c) Colder than last

23. Slag Dipper.
    - (a) White
    - (b) Dark
    - (c) Hot, shot
    - (d) Medium white
    - (e) Black
    - (f) Sulphur spots
    - (g) Warts
    - (h) Sulphur net

24. Sulphur Indicated by Slag on Dipper.
    - (a) None
    - (b) Medium
    - (c) Lots
    - (d) Extreme

25. Dipper Back (Slag Against Dipper).
    - (a) Smooth
    - (b) Little rough
    - (c) Medium
    - (d) Porous
    - (e) Dry

*Table III.*—FURNACE CODE

Symbols Illustrating Furnace Conditions

1. Wind 14,500
2. Stove Heat 1400-1200
3. Steam 80-100
4. Top Heat 400-650
5. Drives →
   Charge sticking ×
6. Checks | Time 7:30
   ↓ Feet 6
7. Good Steam ^
   Medium —
   Low v
   (Shows quality of furnace gas)
8. Number of Charges
   Day shift 47
   Night shift 47
9. Color of Smoke from Stove Stacks (Gas at Stoves).
   (a) Color
   White ○
   Blue ⊗
   Gray ∅
   Brown ⊖
   Yellow ⊙
   Black ●
   (b) Quantity
   None ○
   Thin ○
   Medium ○
   Heavy ○
10. Color of Gas at Bleeder Stack. (See 9)
11. Extra Coke.
12. Quality of Coke.
   (a) Clean ✓
   (b) Medium ✓
   (c) Dirty ×
13. Quality of Stone.
   (a) Large, clean □
   (b) Medium □
   (c) Small, dirty —
14. Tuyeres.
   (a) Heat
   White ○
   Blue ⊙
   Purple ⊕
   Red ⊖
   Cold ●
   (b) Stock at tuyere
   No coke ○
   Little ○
   Medium ○
   Lots ○
   (c) Black lumps Lots Medium Few
   (d) Hot ✓ Medium ✓ Cold ×
   (e) Cinder (slag) C
   (f) Air flames 8
   (g) Lime nose ○
   (h) Clear nose ○
   (i) Blue flames
   (j) Coke movement
   Dead ○
   Slow
   Medium
   Fast
15. Blast Pressure. 14 Pounds
16. Charges Between Casts.
17. Quantity of Iron.
   (a) Ladles of iron
   (b) Beds of iron
18. Furnace Getting
   (a) Hotter >
   (b) Same —
   (c) Colder <
19. Steam Curve
   (a) Smooth
   (b) Medium
   (c) Irregular
20. Furnace Getting
   (a) Limey ✓
   (b) Same —
   (c) Lean ×

the entire iron, slag and furnace condition code, as developed in its completeness and as used for a method of attacking blast furnace research problems. The symbols have been classified under three main divisions, iron symbols, slag symbols and symbols showing the condition of the blast furnace. These codes are illustrated in Tables I, II and III.

It is seen immediately that this symbol method of studying blast furnace operation stimulates the powers of observation. It is only necessary, then, to devise some character that will clearly represent the impression made on the mind and which at some later date will call forth the same mental picture, when the symbol is seen. No attempt has been made to go into the detail of explaining all the symbol characters. The idea is clear, and anyone can make his own set of symbols after making careful observations.

As an example we will now show our research code in practical operation. The following is a symbolic record of all the conditions that entered into making two casts of iron. On coming on "turn" the first step was to see how the furnace had been behaving the night before. The iron and slag analyses are shown below:

| | Iron | | | | Slag | | |
|---|---|---|---|---|---|---|---|
| | Silicon | Sulphur | Phosphorus | Manganese | Silica | Alumina | Bases |
| 1 | 2.32 | 0.032 | ... | ... | 33.80 | 14.12 | 47.08 |
| 2 | 2.26 | 0.037 | ... | ... | .... | .... | .... |
| 3 | 2.77 | 0.018 | ... | ... | .... | .... | .... |
| 4 | 2.00 | 0.024 | 0.78 | 0.87 | .... | .... | .... |
| 5 | 2.62 | 0.021 | ... | ... | .... | .... | .... |
| 6 | 1.92 | 0.034 | ... | ... | .... | .... | .... |

It is of interest to record also some of the conditions as we found them at the start of the "day turn." The filling is on the same schedule as night turn. The stone beam was changed at 6 a. m. from 3900 to 3600 lb. There were 48 charges put in at night. The wind was 14,500 cu. ft. per min. on the turbine, in addition to that blown on the smaller engines. The steam pressure was 100 lb. In addition to the 48 charges put in on night turn, 6 extra coke were put in. On the day before the iron made was 17, 21, 19, 15, 19 and 16 beds respectively. One wheelbarrow load of scrap was put in occasionally, making 2 or 3 to the charge.

The schedule of filling was as follows:

1. Heating cinder.
2. Concentrates.
3. Pyrites cinder.
4. Manganate.
5. Heating cinder.
6. Concentrates.
7. Markelsburg ore.
8. Crude.
9. Scale.
10. Concentrates.
11. Pyrites cinder.
12. Manganate.
13. Heating cinder.
14. Concentrates.
15. Crude.
16. Scale.

A charge was made up as follows:

| | |
|---|---|
| 2 coke | 2,340 lb. |
| 2 ore | 4,000 lb. |
| 1 stone | 3,600 lb. |

The bell was then lowered.

We are now ready to look at the complete filling record for the day turn, in Table IV.

A word of explanation might be helpful in regard to the complete filling record. As is seen from the record, nothing was put into the furnace until 6:35 a. m. Filling then started and was continued until 7 a. m., when the furnace was full. Twenty-five minutes were consumed in filling. It then stood for 35 min. before filling was resumed. It was said to be "full" although it was driving and the charge was gradually

*Table V—Symbol Record of First Cast*

Day Turn, Date.....

| Analysis | Slag: Silica 32.00 | Slag: Alumina 14.38 | Slag: Bases 48.62 | Iron: Silicon .....2.58, Sulphur .....0.015, Phosphorus ...0.72, Manganese ...0.85 | | |
|---|---|---|---|---|---|---|
| Flush Time | 1 7:30 a. m. | 2 8:30 a. m. | 3 9:15 a. m. | 10:00 a. m. | (Cast) | Furnace |
| 1 | | | | — | | 14,500 |
| 2 | | | | | | 1200 1200 |
| 3 | | | | | | 1000 1000 105 105 110 |
| 4 | | | | — | | 620 650 580 |
| 5 |  | | | | | X — |
| 6 | | | | | | 6:35 5 feet |
| 7 | | | | | | 8:00 check |
| 8 |  | | | X | | Night 48 |
| 9 |  |  | | | | 6 extra Coke |
| 10 |  | | | X | | 8 11 |
| 11 |  | | | X | | 17½ |
| 12 |  | | | | | ✓ ✓ ✓ |
| 13 |  | | | | | □ □ □ |
| 14 |  | | | X | | |
| 15 | |  | | | | 12 11.5 11.5 |
| 16 | | | | X | | 12 |
| 17 | | | | X | | |
| 18 | X Sparks | | | X | Thin iron. Limey top on cold sample | ✓ ✓ ✓ |
| 19 | M | E | | X | | — — — |
| 20 | Ex Shot | | | O | | |
| 21 | | | Only two flushes, due to burned tuyere. Furnace hanging all morning. Gave her extra coke. Lots of iron shot on the first flush. Second flush hotter. Extra coke down. Heavy white fumes at cast time. | 17½ | | |
| 22 | < | > | | | | |
| 23 | | | | | | |
| 24 | / | O | | | | |
| 25 | | | | | | |

sinking in the furnace. Three charges were put in between 6 and 7 a. m. When tested with the gage rod the stock was down 6 ft. At 6:35 a. m. a check was put on the furnace to force the charge down and filling was resumed. A furnace should not be allowed to hang more than 35 to 45 min. This kind of a record gives complete detailed information necessary to control intelligently the conditions which govern the composition of the iron and slag.

The period of making the first cast of iron was from 6 a. m. to 10 a. m. The furnace was given a check at 8 a. m. and at 8:15 a. m. the blast was thrown off for 6 min. to change a leaking tuyere. The blast was on again at 8:21 a. m. Ordinarily three flushes of cinder were drawn from the furnace and then the cast made immediately after the third flush. The first flush was usually made 1¾ to 2 hr. after casting, the second ¾ to 1 hr. after the first flush, and the third flush about 45 min. after the second flush.

The complete symbolic record of all the conditions of this first cast of iron, 6 a. m. to 10 a. m., is given in Table V.

tions much as the page of short hand characters reveal the thought and ideas that are hidden behind them.

### Discussion of Results: First Cast

A brief discussion of these two casts of iron as interpreted from the symbols will be of interest. In the first cast, 6 to 10 a. m., the first flush was cold. The first flush after cast is generally colder than the last flush of the previous cast. This is due probably to two reasons—the heat removed by drawing out the iron at cast time, and the cold stock precipitated into the hearth when the wind is taken off to plug up the hole. As seen by No. 2 there was very little smoke coming from the runner on either flush. There was a slight sulphur smell, but not strong. The first flush was lean but, as the hearth heated up, the lime took hold, as seen by the second flush. The slags were solid and contained little gas. The tops were level and the iron shot in the first flush has been the cause of the black top.

There is some sulphur present, as indicated by Nos. 13 and 16; the small runner of No. 15 also shows

*Table IV.—Blast Furnace Filling Schedule*

| Started to Fill | Stopped Filling | Filling, Min. | Full, Min. | Charges | Total | Hour | Total | Drives | Checks | Delays |
|---|---|---|---|---|---|---|---|---|---|---|
| 6:00 a. m. | .... | .. | .. | .. | .. | ..... | .... | .. | ..... | ..... |
| 6:35 | 7:00 a. m. | 25 | 35 | 3 | 3 | 6-7 | 3-3 | 6 | 6:35 | Slipped 6 ft. 7:25 a. m. |
| 7:25 | 7:45 | 20 | 25 | 3 | 6 | 7-8 | 3-6 | 6 | | |
| 8:00 | 8:15 | 15 | 15 | 2 | 8 | 8-9 | 3-6 | 6 | 8:00 | Blast off at 8:15 a. m. |
| 8:21 | 8:35 | 16 | 6 | 1 | 9 | 9-10 | 5-14 | 10 | 8:15 | Blast on 8:21 a. m. |
| 9:25 | 10:10 | 45 | 50 | 5 | 14 | 10-11 | 0-14 | .. | 10:20 | Lost 6 min. changing tuyere. |
| 11:00 | 11:20 | 20 | 50 | 2 | 16 | 11-12 | 5-19 | 10 | | Stopped at 11:20 a. m. Big overload of heating cinder. |
| 11:40 | 12:15 p. m. | 35 | 20 | 5 | 21 | 12-1 | 3-22 | 6 | 12:00 | Cast. |
| | | | | | | | | | 4.5 ft. | Delayed 20 min. |
| 12:50 p. m. | 1:15 | 25 | 35 | 3 | 24 | 1-2 | 6-28 | 12 | | |
| 1:30 | 2:00 | 30 | 15 | 4 | 28 | 2-3 | 2-30 | 4 | | Stone short. |
| 2:25 | 2:40 | 15 | 25 | 2 | 30 | 3-4 | 4-34 | 8 | | Cut back to 14,000 on engines. |
| 3:05 | 3:20 | 15 | 25 | 2 | 32 | 4-5 | 4-38 | 8 | | |
| 3:45 | 4:15 | 30 | 25 | 4 | 36 | 5-6 | 4-42 | 8 | | |
| 4:45 | 5:00 | 15 | 30 | 2 | 38 | | | 84 ft. | | |
| 5:00 | 6:00 | | | | Other turn—42 | | | 7 ft. per hr. | | |
| | | | | Charges—day ..... | | | | 42 | | |
| | | | | Extra coke ..... | | | | 4 | | |

The second cast of iron was made from 10 a. m. to 2 p. m. All the conditions which made this iron are shown by the symbolic characters in Table VI.

The complete analyses of the iron and slag for this day are as follows:

| | Iron | | | | Slag | |
|---|---|---|---|---|---|---|
| | Silicon | Sulphur | Phosphorus | Manganese | | |
| 1 | 2.58 | 0.015 | ... | ... | Silica | 32.00 |
| 2 | 3.54 | 0.014 | ... | ... | Alumina | 14.38 |
| 3 | 2.87 | 0.011 | 0.72 | 0.85 | Bases | 48.62 |
| 4 | 2.82 | 0.013 | ... | ... | | |
| 5 | 2.47 | 0.026 | ... | ... | | |
| 6 | 2.10 | 0.035 | ... | ... | | |

The following notes were made:

6 a. m. to 10 a. m. cast: Check at 8 a. m. Blast off at 8:15 a. m.; blast on at 8:21 a. m. Lost 6 min. changing tuyeres. First slag typical iron shot slag.

10 a. m. to 2 p. m. cast: Cold air turned in after second flush (11 a. m.). Hot white smoke from stoves. Day turn 42 charges, 4 extra coke. Night turn 48 charges, 3 extra coke. Iron 17, 17½, 15½, 16½, 20 and 19½ beds. Average stove temperature, 1150 deg. Fahr. Wind all night, 14,000 cu. ft. per min. Blast pressure, 11.5 to 12 lb. per sq. in. Steam pressure, 110 lb.

This concludes the complete record of every condition that produced two casts of pig iron. In addition to this record in symbol language it is readily seen that, by knowing the analyses of all the ores, coke, limestone, etc., charged into the furnace, the complete story is then revealed. By making such records under all conditions the blast furnace research investigation is quickly solved. In one instance a bad slip was traced back for a week and could have been avoided easily had the precaution that was indicated been followed.

The variation in the symbols becomes prominent in contrasting an extremely lean slag with an extremely limey slag. The characters show the condi-

the slag to be fluid. The first flush shows the free sulphur, as indicated by the sparks. These practically have disappeared on the second flush, when the hearth has become hot enough for the lime to take care of the sulphur. A large amount of iron shot is carried out with the first flush of slag. As the furnace hearth heated up and the sulphur combined with the lime the iron passed on through the slag and into the hearth. This is shown by the same feature in the second flush, which is seen to be hotter than the first and would be expected to be hotter.

Turning our attention to the iron, we find it is thin and solidifies fairly slowly. When the iron sample is broken it shows a medium sized grain. The top also indicates the presence of a large amount of lime in the furnace. The fluidity of the iron is shown also by the dipper in No. 15; it is clean, a condition which could be attained only by a thin, fluid iron. In the runner the iron is clear.

Glancing at the furnace conditions which made this iron, we would expect high-silicon, low-sulphur iron. The stove temperature is high, 1200 deg. Fahr., and the six extra coke the night before would help also to give additional heat. The coke is seen to be in rapid motion in front of the tuyeres.

### Second Cast Results

In the second cast, 10 a. m. to 2 p. m., the furnace was slowly getting hotter. This fact is indicated first by the first flush, which shows the lime in the furnace. The slag is a little thicker and white smoke is beginning to appear, which indicates the lime and heat. The slag tops have changed from dark to white and the runner is getting bigger and heavier. The increase in heat is to be seen also in the gas flames, which are now large and yellow instead of being small. In each successive flush the lime shows more and more and each successive flush is hotter, as indicated in No. 22. The dipper back also points to a hotter cast in this case.

*Table VI—Symbol Record of Second Cast*

Day Turn, Date.....

| Analysis | Slag: Silica 32.00 | Slag: Alumina 14.38 | Slag: Bases 48.62 | | Iron: Silicon .....3.54, Sulphur .....0.014, Phosphorus ..0.72, Manganese ...0.85 | | Furnace |
|---|---|---|---|---|---|---|---|
| Flush Time | 1 11:45 a. m. | 2 12:30 p. m | 3 1:15 p. m. | | 2:00 p. m. (Cast) | | |
| 1 | | | | | | | 14,000 14,000 14,000 |
| 2 | | | | | | | 1200 Cold Air 1050 1100 |
| 3 | | | | | | | 85 105 100 105 100 |
| 4 | | | | | | | 640 650 630 |
| 5 | | | | | | | X |
| 6 | | | | Last | | | ↓ 10:20 ↓ 11:00 |
| 7 | | | | | | | |
| 8 | | | | | | | Night 48 6 Extra |
| 9 | | | | | | | |
| 10 | | | | | | | 10 11 |
| 11 | | | | | | | 17 |
| 12 | | | | | | | ✓ 777 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | 12½ 12 11 10½ 10 |
| 16 | | | | | | | 15 |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | Gas White and heavy most of |
| 21 | | | | | 17 | | the time. 6 extra last night. Cold |
| 22 | | | | | | | air after second flush. |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |

Put cold air in after 2nd flush, two flushes hot. First samples showed 10% of sulphur.

Hot iron. Mushy. High relief. Craters. Coke poor in the afternoon. Driving slow. Cut engines back to 14,000 on account of being short of limestone.

When the iron samples are examined the high silicon, low sulphur is seen at once in the iron top. It is high and rugged. The iron is thick and mucky, showing that the lime has passed its heat on to the iron. The high silicon has removed carbon in the form of graphite and this also has helped to make the iron thick and mucky by removing carbon, which gives iron its fluidity. The runner scrap is high, the iron is cloudy, and the skull in the sample dipper are all additional proof that the analyses will come back showing high silicon and low sulphur. Number 17, the relief of the iron top, with its rugged appearance, resembles a mountain range with large volcanic craters.

Still other indications of a hot cast are the continued pouring out of heavy white smoke from the stove chimneys; and the hearth as seen by looking in the tuyeres. The final analyses show the iron to be 3.54 per cent in silicon and 0.014 per cent in sulphur. Our symbols have indicated all the conditions that made this iron. The whole story is quickly and easily written in a very few minutes on two small pages of a little note book.

This method of conducting research investigation is extremely valuable in that the powers of observation are developed until they become almost uncanny in seeing things. In addition to this, countless facts are stored and recorded for future observation and comparison; the maze of variables is systematized and cataloged in an orderly manner; and the causes are seen easily by comparing and classifying the effects.

## Banner Building Year Ended

New high records in building construction were made in 1924 in four of the seven territorial groups of States reported by F. W. Dodge Corporation, while the country as a whole showed a gain of 12 per cent over the 1923 total, which itself was previously a record-breaking year. Total construction in the 36 Eastern States (accounting for about seven-eights the construction of the entire country) are given as $4,481,807,000. The activity was maintained at a fairly even pace throughout the year, the volume of work started in the second half year being only slightly less than that of the first half.

The big increase in building was shared by every important class of construction, except the industrial. In this industrial group the building operations amounted to $353,149,400, or 8 per cent of the year's total, and showed a decrease of 22 per cent from 1923. Residential buildings amounting to $2,051,643,400 accounted for 46 per cent of the total and showed an increase of 12 per cent over 1923. Public works and utilities were $723,910,700, being 16 per cent of the total, and 10 per cent higher than in 1923. Commercial buildings, $593,768,300, were 13 per cent of the total and 15 per cent above 1923. Educational buildings, $367,438,900, were 8 per cent of the total and 15 per cent over 1923.

In New York and northern New Jersey the year's total was $1,329,396,100, an increase of 24 per cent over 1923—the previous record year. In New England the total was $352,195,100, or 6 per cent above 1923, and a new record. In the Middle Atlantic States the total was $477,746,300, a new record and 28 per cent above 1923. In the Central West the total was $1,049,585,900, a new record, being 0.1 per cent above the previous record year (1922) and 4 per cent above 1923. The Southeastern States showed $606,255,400, almost 25 per cent above 1923 and probably a new record, although figures previous to 1923 are not available. The Pittsburgh district totaled $578,364,500, or 3 per cent below 1923. The Northwest showed $88,263,700, a decrease of almost 31 per cent from 1923. Improved farm purchasing power came too late in the year to help the building program in the Northwest section.

## Freight Traffic in 1924

Second only to 1923, the number of cars loaded with revenue freight in 1924 aggregated 48,527,227, a reduction of 2.6 per cent from the 49,812,113 total of the record year, 1923. The 1924 figures showed an increase of 12 per cent over the 43,207,561 cars of 1922. The high record of the year just closed was made principally by exceptionally heavy figures for the first three months and for the last four months, with an intermediate slump lasting several months during the spring and summer.

Several new records were made during the year, these including the two highest weekly car loading figures ever recorded, the highest loading of merchandise and small lots, as well as of miscellaneous freight, the highest loading of grain and grain products and the largest number of cars moved on a single day at any time in our history. Except for a falling off compared with 1923 in the loading of coal, coke and ore, all of which were produced in much smaller quantities in 1924, the year would have shown a larger total than any other year. It is noteworthy that the heavy car movements took place almost wholly without the exasperating delays of previous periods of high activity, as there were few cases of car shortages reported.

## Properties of Metals at Extreme Temperatures

The symposium on effect of temperature upon the properties of metals held during the Cleveland spring meeting of the American Society of Mechanical Engineers in May, 1924, attracted wide interest and forcibly demonstrated the need for authentic information concerning the properties of metals in the mechanic arts, especially at extremely high and low temperatures. The program was arranged by a joint committee representing the American Society for Testing Materials and the American Society of Mechanical Engineers.

This committee's report to the two societies stressed the need of a further investigation of this subject and recommended that steps be taken to carry it forward under the joint auspices of the two societies. Accordingly, during the months which followed the spring meeting, representatives of the societies have conferred with the result that the societies are now prepared to name the members of the joint research committee on the properties of metals at extreme temperatures:

George W. Saathoff, chairman, chief construction engineer, Henry L. Doherty Co., 60 Wall Street, New York.

George K. Elliott, chief chemist and metallurgist, Lunkenheimer Co., Cincinnati.

H. J. French, physicist, Bureau of Standards, Department of Commerce, Washington.

John B. Johnson, chief material section, engineering division, air service, McCook Field, Dayton, Ohio.

Vincent T. Malcolm, metallurgist Chapman Valve Mfg. Co., Indian Orchard, Mass.

John A. Mathews, vice-president and metallurgist, Crucible Steel Co. of America, Box 11, Grand Central Station, New York.

LaVergne W. Spring, chief chemist and metallurgist, Crane Co., 836 South Michigan Avenue, Chicago.

In the report of the joint symposium committee the three objects to be accomplished by this research committee were outlined as follows:

1. Accumulation of existing unpublished data covering satisfactory and unsatisfactory service in different fields of engineering of various metals under extreme temperatures.

2. The making of studies leading to standardization of the procedure for testing materials at high and low temperatures. These should preferably include studies of new comparative tests of metals by the principal methods now in use in various laboratories and likewise a critical examination of data already published.

3. Outlining and fostering new research work in this field. The first and most important materials to be investigated are considered to be carbon and alloy steels, so-called "heat-resisting" alloys consisting of various combinations of nickel, chromium, iron, tungsten, molybdenum, etc., and trimming materials (chiefly alloys of nickel and copper) for valves and equipment intended for high-temperature service in power stations, oil refineries, etc.

# DISTRIBUTION OF STEEL EXPORTS

## Japan Takes 28,378 Tons in Five Items—Canada Takes 23,739 Tons in Seven Items

SUPPLEMENTING the tables on page 135 of THE IRON AGE of Jan. 8, distribution of exports of seven principal finished steel items appears in the tables here. Outgoing tonnages of steel plates, rails, black and galvanized sheets, barbed wire, plain and galvanized wire and tin plate are covered. The figures are for November, 1924 and 1923, and for the first 11 months in each of the two years.

Canada took the bulk of all the steel plate shipped in each year, about 80 per cent in each case, but there was a sharp decrease in the recent figures, compared with the old, the 11-month total being only 71 per cent as great in 1924 as in 1923.

| Tin Plate: | November 1924 | November 1923 | Eleven Months Ended November 1924 | Eleven Months Ended November 1923 |
|---|---|---|---|---|
| Canada | 1,414 | 2,567 | 21,537 | 27,811 |
| Japan | 10,508 | 3,142 | 46,721 | 27,592 |
| Cuba | 184 | 476 | 4,985 | 4,509 |
| Mexico | 346 | 514 | 3,531 | 2,167 |
| Argentina | 693 | 1,393 | 8,509 | 6,464 |
| Chile | 108 | 570 | 3,006 | 2,170 |
| Uruguay | 28 | 291 | 409 | 3,324 |
| China | 399 | 1,834 | 23,683 | 9,829 |
| British India | .... | 2,284 | 9,432 | 6,465 |
| Hong Kong | .... | 174 | 6,347 | 2,245 |
| Italy | 49 | 1 | 4,013 | 2,267 |

Galvanized sheets, as usual, have been well distributed. Argentina took the largest item in November, with 3618 tons. This covered apparently some of the shipments for combating the plague of locusts. For the 11 months Canada led, with 16,456 tons, and Argentina was second, Philippine Islands being third and Japan fourth. This is in sharp contrast with last year, when Canada led by a large margin, Japan was in second position, followed by Philippines, Mexico, Cuba and Argentina, in that order.

Japan was much the largest purchaser of black steel sheets in November of each year, and in the 11 months of 1924, taking 96,482 tons (68 per cent of the total) in the latter period, while Canada in second position took only 35,070 tons. This is in contrast with 1923, when in 11 months Canada took 47,256 tons to Japan's 41,402 tons.

In steel rails the distribution was fairly general, although British South Africa, with 5798 tons in November (this being all that was shipped to South Africa during the 11 months) was far in advance of Cuba in second position. For the 11 months Cuba led with 45,123 tons, or slightly more than the year before. Japan and Canada occupied second and third positions, both being far below their figures for 1923, in which year they occupied first and second positions, with 79,621 tons and 58,242 tons respectively.

Distribution of barbed wire was scattered, as usual, Brazil taking the largest tonnage in November and in the 11 months in both years. In fact, in 11 months in 1924 Brazil, with one-third of the total, took practically as much as the next four countries combined.

Plain and galvanized wire was shipped in much smaller quantities in 1924 than in the previous year. It was well distributed, Canada receiving the largest amount in 11 months, with Brazil a close second and Japan third. In 1923 Japan led, with Canada, Argentina and Brazil following, in that order.

Japan took by far the largest tonnage of tin plate, both in November and in the 11 months in 1924, although Canada led in 11 months in 1923. Japan's tin plate purchases in November, at 10,508 tons, were larger than those of all other countries combined, being nearly 75 per cent of the total. For the 11 months, with 46,721 tons, Japan exceeded the sum of China's 23,683 tons and Canada's 21,537 tons, these two countries being in second and third positions. In 1923 Canada, in 11 months, took slightly more than did Japan.

## American Shipbuilding Falls Off Heavily

There was a drop of approximately 47 per cent in the value of shipbuilding in the United States between 1921 and 1923, according to figures of the Census Bureau. In 1921 there were 640 establishments, with production aggregating $400,834,105. In 1923 the figures had shrunk to 570 establishments, with production of $213,232,381. The shrinkage had made large progress during 1921, as evidenced by the drop of wage earners from 169,928 in January to 55,825, or less than one-third as many, in December. The average through the year was 106,445 and their wages amounted to $155,943,490, figures which had dropped to 62,287 and $90,719,525 in 1923.

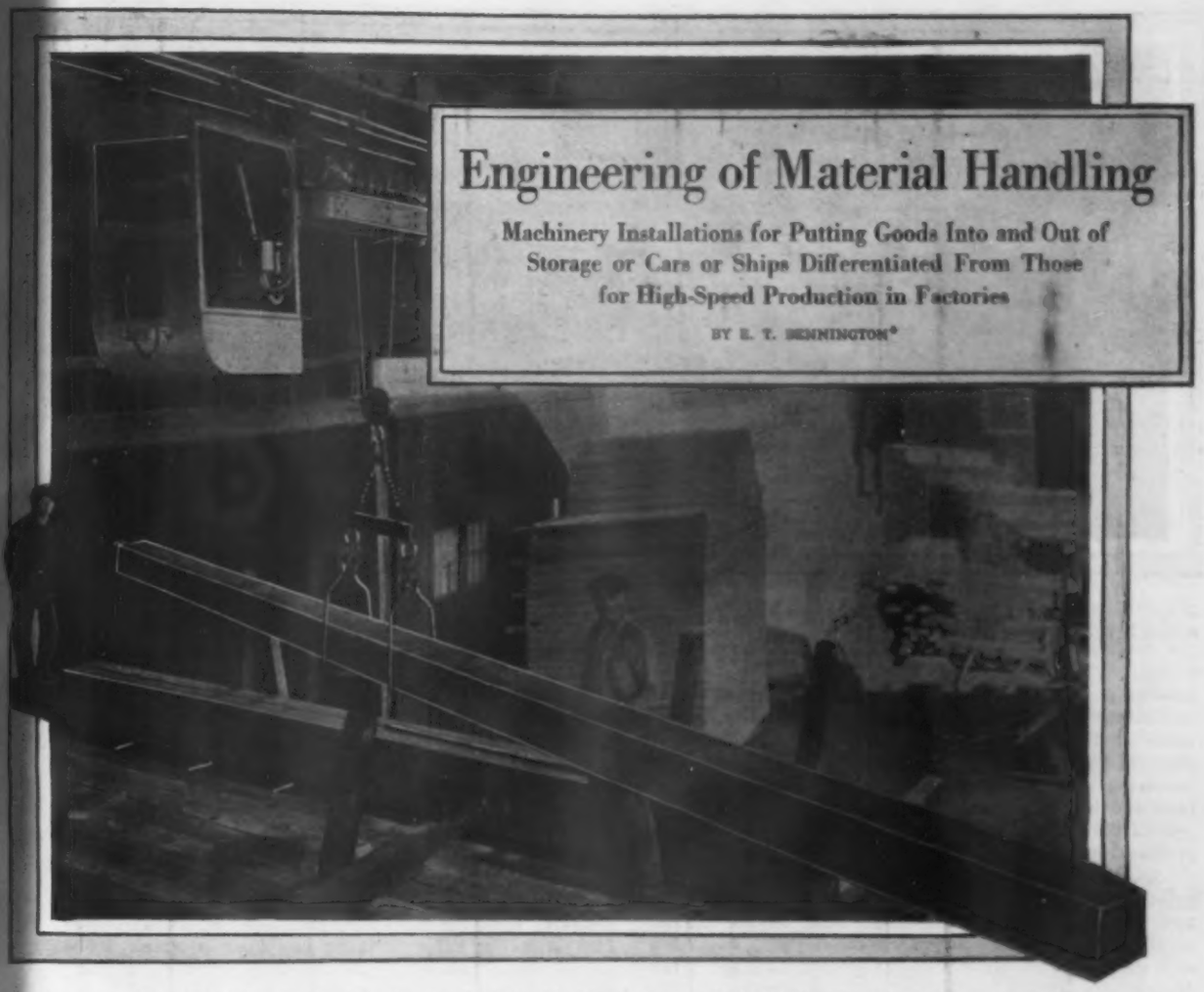
Steel vessels built in 1923 aggregated 289, of 286,182 gross register tonnage. Wooden ships of more than 5 tons numbered 527, of 118,764 tons gross register. A large portion of this group consisted of barges and of motor boats. Boats of less than 5 tons numbered 1043. Repair work during the year aggregated $112,541,433, or 52.8 per cent of the entire value of product. The horsepower used was 320,007 and the coal burned 265,984 net tons.

### Exports from United States by Countries of Destination

(In Gross Tons)

| | Steel Plates | | | | Galvanized Sheets | | | | Black Steel Sheets | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | November | | Eleven Months Ended November | | November | | Eleven Months Ended November | | November | | Eleven Months Ended November | |
| | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 |
| Canada | 3,156 | 4,479 | 62,686 | 88,057 | 1,080 | 683 | 16,456 | 28,980 | 3,790 | 2,231 | 35,070 | 47,256 |
| Japan | 35 | 168 | 611 | 985 | 533 | 919 | 12,547 | 12,626 | 8,040 | 13,769 | 96,482 | 41,402 |
| Cuba | 52 | 2 | 1,310 | 861 | 891 | 1,080 | 10,910 | 5,384 | 17 | 207 | 832 | 1,862 |
| Philippine Islands | 470 | .... | 1,425 | 570 | 1,355 | 1,007 | 13,024 | 7,241 | .... | 6 | .... | 182 |
| Mexico | 9 | 149 | 671 | 711 | 720 | 754 | 5,447 | 6,198 | .... | .... | .... | .... |
| Argentina | .... | .... | .... | .... | 3,618 | 605 | 14,309 | 4,931 | 105 | 69 | 174 | 1,976 |
| Chile | .... | .... | .... | .... | 27 | 92 | 1,237 | 2,790 | .... | .... | .... | .... |
| Colombia | .... | .... | .... | .... | 746 | 350 | 3,771 | 4,343 | .... | .... | .... | .... |
| Central America | .... | .... | .... | .... | 418 | 451 | 4,183 | 3,863 | .... | .... | .... | .... |

| | Steel Rails | | | | Barbed Wire | | | | Plain and Galvanized Wire | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | November | | Eleven Months Ended November | | November | | Eleven Months Ended November | | November | | Eleven Months Ended November | |
| | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 | 1924 | 1923 |
| Canada | 527 | 9,858 | 17,312 | 58,242 | 1,604 | 258 | 3,334 | 4,790 | 340 | 1,016 | 7,863 | 13,856 |
| Japan | .... | 10,684 | 32,470 | 79,621 | .... | .... | .... | .... | 207 | 2,408 | 4,049 | 20,654 |
| Cuba | 1,386 | 490 | 45,123 | 43,027 | 298 | 536 | 7,362 | 8,850 | 111 | 259 | 1,622 | 2,446 |
| Philippine Islands | 440 | 1,037 | 5,763 | 4,787 | .... | .... | .... | .... | .... | .... | .... | .... |
| Mexico | 286 | 183 | 8,330 | 3,207 | 356 | 340 | 3,561 | 3,725 | 168 | 168 | 3,428 | 3,696 |
| Argentina | .... | .... | .... | .... | 537 | 897 | 9,782 | 8,019 | .... | 1,094 | 3,541 | 12,364 |
| Chile | .... | 72 | 9,102 | 5,320 | .... | .... | 20 | .... | 1 | 152 | 27 | 4,205 |
| Colombia | 66 | 1,032 | 10,036 | 3,195 | 1,016 | 272 | 6,599 | 3,987 | .... | .... | .... | .... |
| Brazil | .... | 340 | 10,339 | 4,056 | 1,795 | 2,377 | 27,929 | 10,491 | 170 | 2,035 | 7,391 | 9,036 |
| Chosen | .... | 892 | 36 | 3,293 | .... | .... | .... | .... | .... | .... | .... | .... |
| Honduras | .... | 550 | 3,517 | 8,795 | .... | .... | .... | .... | .... | .... | .... | .... |
| Kwan Tung | .... | .... | .... | 11,143 | .... | .... | .... | .... | .... | .... | .... | .... |
| Australia | .... | .... | .... | .... | 140 | 126 | 2,929 | 2,334 | 394 | 248 | 2,553 | 6,530 |
| British S. Africa | 5,798 | .... | 5,798 | .... | 215 | 315 | 4,543 | 5,344 | .... | .... | .... | .... |



# Engineering of Material Handling

## Machinery Installations for Putting Goods Into and Out of Storage or Cars or Ships Differentiated From Those for High-Speed Production in Factories

BY E. T. BENNINGTON*

Even the Most Unwieldy Loads Can Be Handled by Machinery Successfully if the Proper Engineering Principles Are Observed

DESIGNING and applying machinery to the handling and moving of materials is a problem to which no definite set of rules can be applied. Experience, good judgment and common sense have proved effective when attacking a subject of this nature. All material handling machinery can be separated into two general classes: that which is used as a part of the production machinery of manufacturing plants, and that which is used for the sole purpose of handling material on docks, in warehouses, etc. While the same type of machinery often is employed for both types of application, the engineering problems encountered are usually different.

To cover the subject properly it is necessary to discuss each type of application separately. Certain crude forms of machinery have been used for many years on docks and in warehouses, principally for the purpose of loading boats. However, the types of machinery used 25 years ago are entirely different from the machinery being purchased today. Even in the past five or ten years there have been radical changes.

On a recent trip to Mobile I saw an old escalator which was installed about 50 years ago and still is being used. This was a home-made affair driven by an old steam engine and was to load and unload freight from ships when the tide did not favor the movement of material. While the machine performed its work in a certain way, it cannot be compared to the modern moving platform used today, which carry five or six men with their trucks, at one time, up a steep incline.

Another interesting and more important example of the early use of machinery in warehouses is to be found in Memphis, Tenn. A good many years ago a large warehouse was built to handle a large proportion of the cotton grown in that section of the country. The manager conceived the idea of installing a monorail system that used trained mules as the motive power, to propel long trains of cotton bales from the railroad siding or boat landing to any one of a large number of buildings in which cotton is stored. About 25 buildings, owned and operated by this company, cover a space about the size of the "Loop" in Chicago, which means that most of the cotton has to be conveyed a great distance from the point at which it is received. In this warehouse the process of handling material is about as follows:

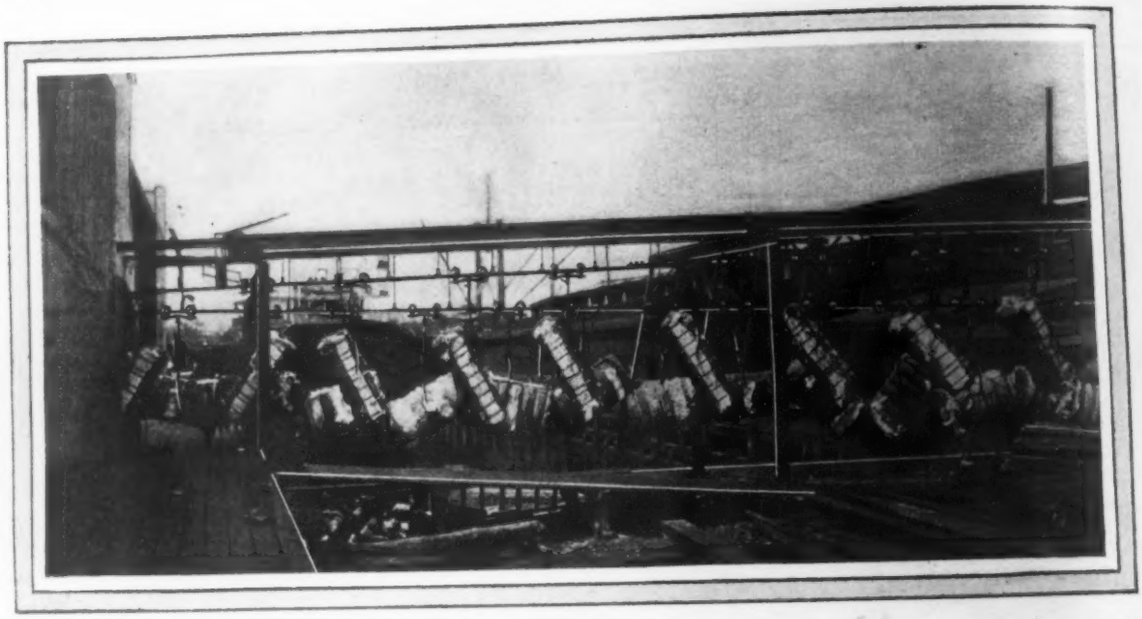
After the receiving clerk's gang has weighed and sampled the cotton, about 25 bales are caught up on the monorail system and a trained mule is brought up with a special harness, including a long ram in front that is used as a pusher. The negro mule starter sees that the ram is in the proper position on the last bale in the train and then he says "Giddap" and the mule starts pushing. The switches are all set in advance and the mule simply follows the load to its destination. When he reaches the building to which the cotton is consigned the receiving gang stops the mule and sends him back with a train load of empty carriers.

While the machinery used in this installation is very crude when measured by present-day standards, the engineering principles involved from a material handling standpoint were excellent and could not be improved upon today.

### Limiting the Number and Types of Appliances

Material handling engineering is like any other form of engineering in that there are fundamental principles that must be understood and observed if the work is to be successful. One of these principles is the fact that the number, kinds and types of machinery

*Manager electric tramrail division, Cleveland Crane & Engineering Co., Wickliffe, Ohio. This is part of a paper read before the Cleveland Engineering Society. A second and concluding installment will appear next week.



A Cotton Warehouse of the South Using Material Handling Machinery of an Extremely Flexible Nature. Each bale of cotton is a separate unit in itself and they can be consigned to different parts of the warehouse when required. This equipment takes the place of 50 negroes with hand trucks and elevators

used to perform a certain task should be limited to the minimum. Otherwise, handling costs will be high in spite of the use of machinery. A load cannot be changed from one form of machinery to another without involving delays and labor, and invariably these delays and labor amount to a great deal more than the optimistic engineer is likely to realize at the time he is drawing his plans.

An outstanding example of this kind of engineering exists in the industry just referred to. Some 10 years ago a certain Government institution in the South, about to erect a large cotton warehouse, sent engineers and specialists to Manchester, England, to inspect the Manchester Cotton Safes, a very successful cotton warehouse which probably handles more bales of cotton per man, per day, than any other cotton warehouse on the face of the globe. They found there a large concrete building so designed that boats dock on one side of the building and railroad cars are spotted on the other side, with the warehouse between the boats and the railroad.

In the warehouse were a large number of cranes with runways, extending over the platform at ship's side on the port side of the building and running through the warehouse to the railroad siding on the landing side of the building. With this arrangement the cotton is picked up by the crane at ship's side and either deposited in the warehouse or conveyed on through the warehouse to the railroad cars. In other words, the crane is used as the one form of material handling machinery, which results in an unusually efficient handling scheme. The reason for this efficiency is the fact that it is unnecessary to set the load down and pick it up a number of times in handling from one place to another.

### Painting the Lily

Returned to this country, the engineers decided to make improvements on the scheme they had seen, with the result that they introduced many different types of material handling machinery and lost track of the big idea entirely. In this warehouse many negroes are used with hand trucks, electric trucks, steam hoists, escalators, belt conveyors, storage battery trucks, over 50 of them, and 33 cranes with over 100 crane runways. The result is that it takes so many negroes to transfer the loads from one conveyor to another and take care of the machinery involved that the warehouse is losing money. It always has lost about $1,000,000 a year, and would not be in existence today if it were not a public-owned and operated affair.

Only one form of material handling machinery is used in the cotton warehouse illustrated, to transport baled cotton from the compress building, along the wharf, across the street and railroad siding to either the first or second floor of a large warehouse and through this warehouse from one end to the other. The only labor required to handle 100 bales of cotton per hour with this system consists of two negroes on the compress end and three or four on the receiving end.

Space does not permit a more complete discussion of material handling machinery problems in warehouses. This is a big subject; there has been a great deal accomplished toward mastering this problem in the past few years and there certainly is going to be a great deal more accomplished in the next few years. The principles involved in planning material handling machinery to be used as part of the production machinery in industrial plants is a big subject involving many industries and many angles in each industry. I am going to try to explain some of the engineering principles that make for success or failure in the use of material handling machinery in this way.

### Material Handling for Heavy Production

As an industry, the automotive group is far ahead of any other large industry in manufacturing and production methods. Other industries continually look to the automotive industry for ideas, when confronted with a particularly hard problem. Recently I was informed by a pottery manufacturer, just returned from a visit to the Ford plant at Detroit, that he was attempting to apply some of the production methods to his business that he had observed there. These production methods which caught his attention were, in the final analysis, purely and simply material handling ideas that would work for him just as well as for Mr. Ford.

The general manager of a large plant manufacturing box cars in the Pittsburgh district had his engineering department working some time ago on a new production system that involved the continuous assembly of box cars while the cars were being propelled slowly through the assembly room. This is exactly what most automobile manufacturers are doing and is nothing more nor less than proper handling of material. Material handling machinery makes this kind of assembly possible.

Machine tools and most forms of production tools have reached a stage of development and perfection in which they are about 99 per cent efficient. Automatic punch presses, automatic screw machines and many other forms of automatic machinery on the mar-

ket reduce to minimum the labor involved in producing the product or performing the machine operation on the product. But the trouble now is, how to handle the product to and from the different machines, or, in other words, the proper planning of material handling machinery.

### Feeding a Machine to Capacity Essential

In Chicago I saw a newly developed automatic turning machine that produced wood handles and wood turnings of different types and sizes. This machine was designed by the manufacturer for his own use and he made the machine produce the finished product more rapidly than it was possible to deliver raw material and take away the finished product. In other words, he could not begin to keep the machine in continuous production, because he had not incorporated a system of mechanically handling the material to and from the machine.

A plant properly equipped with the latest production tools, which still depend on hand labor to remove the material to and from the production tools, is not properly balanced. It is not easy to plan properly an installation of material handling machinery in a manufacturing plant not designed to accommodate it, or in which the location of the machine is such as to make the use of any kind of material handling machinery a difficult problem. This sometimes makes it necessary for the engineer in charge to accept a compromise between what would be ideal and what would be most practical for his particular conditions, but, in starting to plan the material handling machinery, he would start at the foundation. One of the first difficulties that usually manifest itself is the lack of standardization of the product of the plant in which the machinery is to be used. This lack of standardization need not in itself render the use of material handling machinery impossible, but it does bring home to the engineer the necessity of applying ingenuity to the problem, in an effort to take the product as it is and develop standards that will permit machinery to be used.

Two years ago many automobile manufacturers would let the car buyer select the color of paint and several other details of finish, etc. Today few companies will do this, and none of the large companies using real production machinery will permit anything but a standard machine. Gray paint does not cost more than black paint, but the lack of standardization in output costs a great deal more than most engineers realize. It is true that not every company can produce a standard product only, but many companies which could standardize on their product are not doing so.

Before the war one pottery manufacturer produced several thousand styles and designs of bathroom pottery. His policy at that time was to make a special design for each jobber, but today he has adopted continuous production of a standardized line of less than 100 designs, and these designs are all worked out with the idea of permitting the use of the same material handling machinery in each case.

## Status of the Worker

Some startling figures are given by the International Labor Office at Geneva, Switzerland, on real wages of working people, gaged by the purchasing power of the pay envelope. The figures relate to the summer of 1924 and show that the workingman of Philadelphia consumed more than twice as much food value as the workingman in London and four times as much as the workingman of Vienna or Rome or Berlin. Some of the figures given, taking London as the basis, or 100, are as follows:

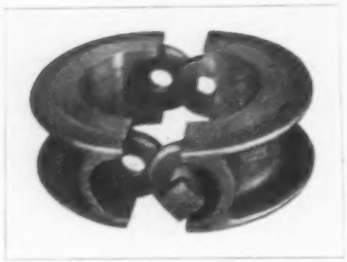
Philadelphia 214, Ottawa 173, London 100, Amsterdam 89, Warsaw 83, Stockholm 81, Paris 73, Christiania (now Oslo) 72, Brussels 59, Madrid 57, Prague 56, Berlin 55, Vienna 47, Milan 46, Rome 46 and Lisbon 32.

Handling Scrap Paper in a Large Paper Factory Requires Machinery of Great Flexibility. In feeding the digesters it is necessary to procure paper of different grades from different parts of the warehouse. The proper material handling machinery for any job will take the material from the place of origin to its destination with one handling

## Malleable Iron Safety Collar

Strength and light weight are features of the safety collar illustrated which has been placed on the market by the Link-Belt Co., 910 South Michigan Avenue, Chicago, and is intended to maintain alinement of pulleys, shaft bearings, hangers and other power transmission equipment.

The device is of malleable iron and although split in two pieces, as shown, to permit convenient installation and adjustment, a collar of solid ring type is also available. The material used is said to possess wear and rust resisting qualities, the latter characteristic adapting the device to employment under unfavorable atmospheric conditions. The set screw, by which the collar is fixed to the shaft, is flange protected. The device will be marketed through dealers.

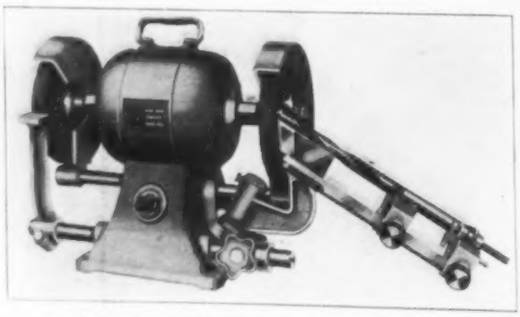


The Collar Is Split to Permit Convenient Installation and Adjustment. A solid ring type collar, also made of malleable iron, is available

## Bench Type Twist Drill Grinder

A motor-driven twist drill grinder for mounting on a bench or pedestal and intended for small shops has been added to the line of the Black & Decker Mfg. Co., Towson, Md. Its capacity is for twist drills up to ⅝ in. in diameter, either straight or taper shank.

The twist drill is fed to the cup grinding wheel by means of a micrometer screw feed. Adjustments for drills of different sizes are said to be unnecessary, this being compensated for in the design. The machine is equipped with one general purpose grinding wheel and one cup wheel, as shown in the illustration. A tool rest, wheel guards, electric switch in the base and cable with plug for attachment to lamp socket are also part of the equipment. A pedestal with water pot is also available.



The Capacity Is for Twist Drills Up to ⅝ In. in Diameter

## Makes Poles of Copper-Bearing Steel

Steel poles for such uses as electric power transmission lines, built by the Truscon Steel Co., Youngstown, Ohio, are hereafter to be made of copper-bearing steel as a material resisting rust and making galvanizing unnecessary. These poles, it may be recalled, consist of two structural steel channels of which the center portion of the web is sheared and pressed out to secure a tapered pole and one of a section resisting the stresses met in transmission lines.

The decision to use the copper-bearing steel arises in part from an experience the company has had in the use of copper-bearing steel sheets forming the roofs of its standard steel buildings and employed in certain types of steel sash. Tests were conducted on uncoated sheets placed in the roof of the plant garage and these sheets have been in place for a period of some seven years.

## Union Mined Coal Losing Ground

It is pointed out by the National Coal Association that the Jacksonville agreement regarding union wages has resulted during the year in a decline in union production of bituminous coal and an increase in non-union production. Instead of about 60 per cent union and 40 per cent non-union, as in 1923, the production of 1924 was approximately 60 per cent non-union and 40 per cent union. Compared with 1920, Alabama, Kentucky and West Virginia, predominantly non-union, showed increases of 18, 25 and 20 per cent respectively. Union States, such as Ohio, Indiana and Illinois, showed reductions of 12, 11 and 11 per cent. Pennsylvania, which is part union and part non-union, just about held its own.

## Ball Bearing with Grease Retainer Feature

A ball bearing, developed primarily for the clutch pilot position in automobiles and an outstanding feature of which is a steel retainer for holding a supply of grease for lubrication over an extended period of time, has been placed on the market by the Standard Steel & Bearings, Inc., Plainville, Conn.

The Steel Retainer Holds a Supply of Grease for Lubrication Over an Extended Period. It consists of a pressed steel disk snapped into a groove in the outer race as shown

The lubricant retainer consists of a pressed steel disk snapped into a groove in the outer race, as shown in the accompanying illustration. In addition to providing proper lubrication for the bearing and keeping it free of dirt, the retainer is claimed to permit of a simpler and less expensive mounting. It is said to eliminate the necessity of a separate seal and extra parts, to reduce machining operations, and to facilitate assembling.

The bearing is equipped with a maximum number of large size balls, which are separated by a riveted "stay-rod type" ball cage. The groove curvatures are made to conform closely to the contour of the balls. Both the races and balls are of a high-carbon chrome alloy steel.

The Donner Steel Co. has made application to the Supreme Court of the District of Columbia for a writ of certiorari, asking to have the Interstate Commerce Commission send up the record in the case which the company had before the commission in which it sought allowances from railroads serving the Donner plants for spotting services performed by the company's equipment or to have the railroad companies themselves do the spotting. The commission denied the company reparation, which involved about $498,000.

The annual dinner of the officials and department heads of the Weirton Steel Co., Weirton, W. Va., was held at the Fort Steuben Hotel, Steubenville, Ohio, Saturday evening, Jan. 10. Interesting addresses were made by E. T. Weir, president of the company, and by J. C. William, vice-president and general manager.

# DECEMBER STEEL OUTPUT

## Increase Over November About 10 Per Cent in Daily Rate—1924 Total 36,645,000 Tons

A substantial gain in steel ingot production in December brought the month's total to the largest since March. At 136,609 gross tons per day the December output registered a 10 per cent gain or 12,320 tons per day over the November rate. The steady expansion from the low point in July continued until the production last month was nearly double the July rate.

The statistics of the American Iron and Steel Institute show that the December output of the companies which made 94.84 per cent of the country's total in 1923 was 3,368,551 gross tons. Assuming that the 5.16 per cent not reporting produced at the same rate, a total December output is indicated of 3,551,825 tons. The corresponding annual rate is about 42,500,000 tons or about 78½ per cent of capacity, against 71.6 per cent in November.

The table gives the production by months of the different kinds of steel, together with the estimated daily rate for all companies.

The 1924 total of 36,645,400 tons shows a decline of about 16 per cent from the 1923 output.

*Monthly Production of Steel Ingots, Reported by Companies Which Made 94.84 Per Cent of the Steel Ingot Output in 1923*
(Gross Tons)

| Months 1924 | Open-Hearth | Bessemer | All Other | Calculated Monthly Production all Companies | Approximate Daily Production all Companies |
|---|---|---|---|---|---|
| Jan. .... | 2,766,534 | 667,032 | 12,577 | 3,633,639 | 134,579 |
| Feb. .... | 2,902,641 | 695,905 | 14,085 | 3,809,185 | 152,367 |
| March .. | 3,249,783 | 706,801 | 15,260 | 4,187,942 | 161,075 |
| April ... | 2,575,788 | 573,381 | 12,356 | 3,333,535 | 128,213 |
| May .... | 2,060,896 | 425,099 | 6,648 | 2,628,261 | 97,343 |
| June ... | 1,637,660 | 310,070 | 2,622 | 2,056,466 | 82,259 |
| July .... | 1,525,912 | 241,880 | 5,162 | 1,869,416 | 71,901 |
| Aug. ... | 2,042,820 | 361,781 | 5,759 | 2,541,501 | 97,750 |
| Sept. ... | 2,252,976 | 409,922 | 6,844 | 2,814,996 | 108,269 |
| Oct. .... | 2,505,403 | 438,468 | 7,030 | 3,111,452 | 115,239 |
| Nov. ... | 2,479,147 | 459,349 | 8,397 | 3,107,226 | 124,289 |
| Dec. ... | 2,810,404 | 546,506 | 11,641 | 3,551,825 | 136,609 |
| Total.. | 28,809,964 | 5,836,194 | 108,381 | 36,645,444 | 117,453 |
| 1923 | | | | | |
| Jan .... | 2,906,892 | 728,270 | 9,467 | 3,841,095 | 142,263 |
| Feb. .... | 2,613,564 | 669,903 | 10,797 | 3,471,843 | 144,660 |
| March .. | 3,046,309 | 799,525 | 12,841 | 4,066,680 | 150,618 |
| April ... | 2,974,579 | 772,485 | 13,933 | 3,963,736 | 158,549 |
| May .... | 3,136,553 | 847,413 | 16,719 | 4,216,355 | 156,161 |
| June ... | 2,821,239 | 737,845 | 15,483 | 3,767,256 | 144,894 |
| July .... | 2,658,449 | 680,854 | 11,496 | 3,531,458 | 141,258 |
| Aug. ... | 2,796,370 | 701,059 | 9,326 | 3,695,788 | 136,881 |
| Sept. ... | 2,562,771 | 613,709 | 8,602 | 3,356,776 | 134,271 |
| Oct. .... | 2,735,513 | 649,452 | 9,163 | 3,577,091 | 132,485 |
| Nov. ... | 2,348,361 | 616,335 | 9,209 | 3,134,321 | 120,551 |
| Dec. ... | 2,135,898 | 570,004 | 10,912 | 2,863,266 | 114,531 |
| Total.. | 32,736,503 | 8,386,889 | 138,048 | 43,485,665 | 139,825 |

# ACTIVE STACKS INCREASE

## Nine More Pittsburgh District Furnaces in Production Than a Year Ago

PITTSBURGH, Jan. 12.—The new year started with nine more blast furnaces in production in the Pittsburgh and nearby districts than at the beginning of 1924. December saw a net gain of 19 furnaces in the number of active furnaces, carrying the total to 101. That compares with 82 at the beginning of December and 91 on Jan. 1, 1924. By districts, Pittsburgh has four more furnaces in production than a year ago; the Valley districts three more; the western Pennsylvania two less than a year ago, while the Wheeling district shows the same number of furnaces active as on Jan. 1, 1924. Of the 99 furnaces in production as of today, 11 are merchant stacks and the same number of such furnaces was engaged at the start of 1924, although the furnaces now producing are not the same ones that were active a year ago.

The record of the furnaces in and out of production as of today compares with that for a month and a year ago as follows:

| | Jan. 5, 1925 | | Dec. 1, 1924 | | Jan. 1, 1924 | |
|---|---|---|---|---|---|---|
| | Total | In Out | In | Out | In | Out |
| *Pittsburgh District* | | | | | | |
| STEEL WORKS FURNACES | | | | | | |
| American Steel & Wire Co. | | | | | | |
| Donora | 2 | 1 1 | 1 | 1 | 1 | 1 |
| Shoenberger | 2 | 0 2 | 0 | 2 | 2 | 0 |
| Carnegie Steel Co. | | | | | | |
| Carrie | 7 | 7 0 | 7 | 0 | 7 | 0 |
| Clairton | 3 | 3 0 | 2 | 1 | 3 | 0 |
| Duquesne | 6 | 4 2 | 4 | 2 | 5 | 1 |
| Edgar Thomson | 11 | 10 1 | 7 | 4 | 9 | 2 |
| Edith | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Isabella | 3 | 2 1 | 1 | 2 | 2 | 1 |
| Lucy | 2 | 2 0 | 2 | 0 | 0 | 2 |
| Neville | 1 | 0 1 | 0 | 1 | 1 | 0 |
| Jones & Laughlin Steel Corporation | | | | | | |
| Aliquippa | 5 | 5 0 | 4 | 1 | 5 | 0 |
| Eliza | 6 | 6 0 | 5 | 1 | 4 | 2 |
| Soho | 1 | 0 1 | 0 | 1 | 0 | 1 |
| National Tube Co. | 4 | 4 0 | 3 | 1 | 4 | 0 |
| Pittsburgh Crucible Steel Co. | 2 | 2 0 | 1 | 1 | 1 | 1 |
| Pittsburgh Steel Co. | 2 | 2 0 | 1 | 1 | 1 | 1 |
| MERCHANT FURNACES | | | | | | |
| Clinton Iron & Steel Co. | 1 | 1 0 | 1 | 0 | 0 | 1 |
| Total | 59 | 49 10 | 29 | 20 | 44 | 15 |
| *Mahoning and Shenango Valley Districts* | | | | | | |
| STEEL WORKS FURNACES | | | | | | |
| Carnegie Steel Co. | | | | | | |
| Farrell | 3 | 3 0 | 2 | 1 | 3 | 0 |
| New Castle | 4 | 3 1 | 2 | 2 | 2 | 2 |
| Niles | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Ohio | 6 | 4 2 | 5 | 1 | 6 | 0 |
| Sharon | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Republic Iron & Steel Co. | 7 | 5 2 | 4 | 3 | 4 | 3 |
| Sharon Steel Hoop Co. | 1 | 1 0 | 1 | 0 | 1 | 0 |
| Trumbull Cliffs Furnace Co. | 1 | 1 0 | 1 | 0 | 1 | 0 |
| Youngstown Sheet & Tube Co. | 9 | 6 3 | 6 | 3 | 5 | 4 |
| MERCHANT FURNACES | | | | | | |
| A. M. Byers Co. | 1 | 1 0 | 1 | 0 | 1 | 0 |
| Hanna Furnace Co. | | | | | | |
| West Middlesex | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Leetonia, Ohio | 1 | 1 0 | 0 | 1 | 1 | 0 |
| Dover, Ohio | 1 | 1 0 | 1 | 0 | 0 | 1 |
| Reliance Coke & Furnace Co. | | | | | | |
| West Middlesex | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Sharpsville, Pa. | 1 | 1 0 | 1 | 0 | 0 | 1 |
| McKeefrey Iron Co. | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Sharpsville Furnace Co. | 1 | 1 0 | 1 | 0 | 1 | 0 |
| Shenango Furnace Co. | 2 | 2 0 | 2 | 0 | 1 | 1 |
| Struthers Furnace Co. | 1 | 0 1 | 0 | 1 | 1 | 0 |
| Stewart Furnace Co. | 1 | 1 0 | 0 | 1 | 1 | 0 |
| Valley Mold & Iron Corp. | 1 | 0 1 | 0 | 1 | 0 | 1 |
| Total | 46 | 31 15 | 27 | 19 | 28 | 19 |
| *Western Pennsylvania* | | | | | | |
| STEEL WORKS FURNACES | | | | | | |
| Bethlehem Steel Co., Johnstown, Pa. | 11 | 8 3 | 6 | 5 | 4 | 7 |
| MERCHANT FURNACES | | | | | | |
| Adrian Furnace Co. | 1 | 0 1 | 0 | 1 | 1 | 0 |
| American Manganese Mfg. Co. | 2 | 0 2 | 0 | 2 | 0 | 2 |
| Kittanning Iron & Steel Mfg. Co. | 1 | 0 1 | 0 | 1 | 0 | 1 |
| McKinney Steel Co. | | | | | | |
| Scottdale, Pa. | 1 | 1 0 | 1 | 0 | 1 | 0 |
| Josephine, Pa. | 2 | 0 2 | 0 | 2 | 2 | 0 |
| Perry Furnace Company | 1 | 1 0 | 1 | 0 | 0 | 1 |
| Punxsutawney Furnace Co. | 1 | 0 1 | 0 | 1 | 1 | 0 |
| Total | 20 | 10 10 | 8 | 12 | 9 | 11 |
| *Wheeling District* | | | | | | |
| STEEL WORKS FURNACES | | | | | | |
| Carnegie Steel Co. | | | | | | |
| Bellaire, Ohio | 2 | 2 0 | 1 | 1 | 2 | 0 |
| Mingo, Ohio | 4 | 3 1 | 2 | 2 | 3 | 1 |
| Steubenville, Ohio | 1 | 0 1 | 0 | 1 | 0 | 1 |
| National Tube Co. | 2 | 1 1 | 1 | 1 | 2 | 0 |
| Wheeling Steel Corporation | 4 | 4 0 | 3 | 1 | 2 | 2 |
| Weirton Steel Co. | 1 | 1 0 | 1 | 0 | 1 | 0 |
| Total | 14 | 11 3 | 8 | 6 | 10 | 4 |
| Grand Total | 139 | 101 38 | 82 | 57 | 91 | 48 |

**Increased automobile trucking operations by the New York Central Railroad were predicted by G. C. Woodruff, general freight agent, before the National Automobile Chamber of Commerce, New York. He pointed out that in the southern divisions of the railroad the motor truck is being used to save freight train operations and at the same time give improved service in congested localities. It is being used also on cross hauls from one division to another nearly parallel to it, and is being used also at Buffalo between the New York Central and some of its connections.**

**Included in the budgets of the United States Steel Corporation are various improvements at Gary, Ind., including a new power station, improvements to the rail mill and three blast furnaces.**

# TREND OF IRON AND STEEL MARKETS

*1. Steel prices are in process of being stabilized, with advances occurring in those items which have been out of line.*

*2. Pig iron is still relatively low in price and should advance somewhat more than finished steels. This relative strength, however, will end in another month or two, as iron production is gaining on the steel output.*

*3. Steel unfilled orders are relatively small and the demand outlook is only about "fair."*

*4. The price advances to be expected will probably be moderate, for several reasons: (a) Sharp gains have brought production to a high level; (b) Buyers are showing no anxiety; (c) Foreign competition is growing; (d) Stocks of merchant pig iron are large.*

*5. Moderate advances in iron and steel can be expected with assurance by buyers for the second quarter; but overbuying should be guarded against.*

BY DR. LEWIS H. HANEY
Director, New York University Bureau of Business Research

STEEL producers have nearly all the business they can handle for the current quarter, while buyers have filled their nearby requirements. Buyers, however, generally recognize the necessity of some price advances, though they anticipate no scarcity or anything approaching a runaway market.

The existing price structure remains to be tested and the big question already is, What of the second quarter? On the one hand, *production of steel is nearly up to the normal trend (See Fig. 1) and will certainly be above normal inside of two months.* On the other hand, *the prospective demand based on industrial requirements is only "fair."* Prospective railroad requirements, especially for track material and construction, may be classed as good. The automobile demand outlook is only fair, and competition and price cutting in this field will make the automobile trade a very close buyer. Building requirements in 1925 will be less than in 1924. While undoubtedly oil prices are due to rise, the requirements of steel in the oil industry will be relatively small in quantity. The outlook for steel exports is poor. Farm demand should be good.

It seems that production of steel in excess of 80 per cent of capacity will be found to be "over-production."

The danger of stimulating production is real and any considerable advance in steel prices would bring in new furnaces. The reports of conservatism among steel producers are therefore encouraging.

There is remarkable stability in steel prices in view of the increased production, which indicates that it is realized that the market will not stand any large advances. With German bars selling on our seaboard at about $8 a ton below the delivered price of domestic producers, and with Belgian rails laid down in Detroit at figures much below our prices, the limitations of the situation are clear.

Pig iron production is gaining on the ingot output. In the past this condition, when occurring during an upturn, has often preceded the peak by only a few months.

## Steel: Demand, Supply and Price

AS usual, the production of steel ingots has advanced before prices and is rising faster. Reasoning merely on the basis of past performance, further gains in the general level of steel prices are to be expected. As yet the production of steel ingots has barely attained the normal level, after a period of seven or eight months in which it has been subnormal. When taken together with the trend of iron costs and the recent sharp gains in unfilled orders, this condition suggests further price advances.

Until unfilled orders make further gains in comparison with the

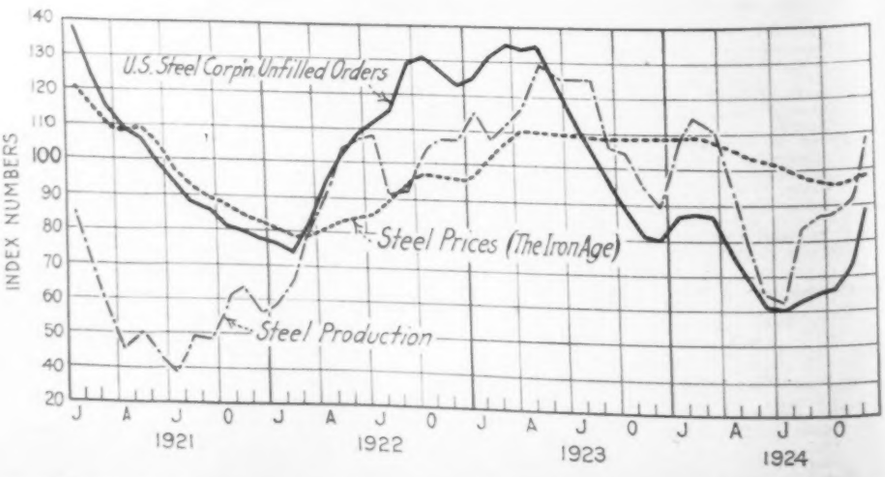



**Fig. 1. Steel Trends: Production, Unfilled Orders, and Prices**
The price curve represents the movement of THE IRON AGE composite index of finished steel. The production curve represents the true trend of ingot output, the monthly figures of the American Iron and Steel Institute being adjusted to eliminate normal growth and the merely seasonal variations. The unfilled orders are as reported by the United States Steel Corporation, adjusted to eliminate seasonal variation

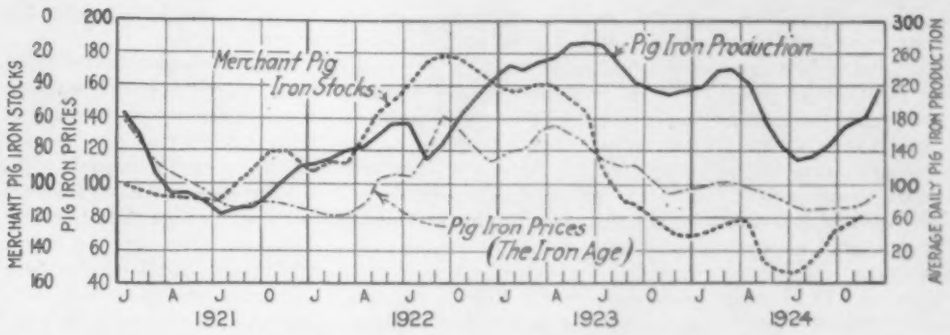



**Fig. 2. Iron Trends: Production, Stocks and Prices**

The production curve is the average daily production of pig iron, adjusted to eliminate the usual seasonal variations. (This curve differs from the steel production curve in that the long-time trend has not been eliminated.) The curve showing trend of stocks is drawn on an inverted scale so that the low points represent the accumulation of large stocks. The price curve shows the trend of THE IRON AGE composite for pig iron

output of steel, however, there appears to be no probability of any sharp advance in the general level of steel prices. Probably the outstanding point revealed in Fig. 1 is the fact that, in spite of large increases in November and December, the unfilled orders of the Steel Corporation are still very low in comparison with production. With the exception of the early spring of 1924, *unfilled orders have not been so low in comparison with production at any time during the last four years as they have been in recent months.* It seems fair to conclude that production is keeping well up to buying, and that the gains in unfilled orders are to be regarded merely as a recovery from an abnormally low level.

Undoubtedly, however, *there has been a gain in forward buying and there is a notable unanimity of opinion that at least moderate advances in steel prices are in prospect for the second quarter.*

A study of the chart (Fig. 1) suggests that the chances favor a stabilization of steel prices in the early part of 1925.

## Iron: Production, Stocks and Price

THE tendency of production to anticipate the trend of prices at the bottom of the cycle is clearly shown in Fig. 2; and, as in the case of steel, further gains in iron prices are indicated.

In 1921, however, production of pig iron fell to a lower level (both absolutely and in comparison with price) than was true in 1924. In other words, there has been a less thorough liquidation and *probably the unsatisfied requirements are now less than in the earlier period.*

A significant fact revealed by Fig. 2 is the relatively high level of stocks of merchant pig iron. (The curve showing stocks is inverted.) In spite of the fairly sharp decline during recent months, stocks are still greater than in 1921 and are notably large both in relation to production and to prices.

A glance at the production curve shows that the average daily output of pig iron in December had attained a high level. It was probably slightly above the general trend of the last four years and was about the same as in the Decembers of 1922 and 1923. *This high level of production, taken together with the rather large stocks of merchant pig, make any such price advances as*

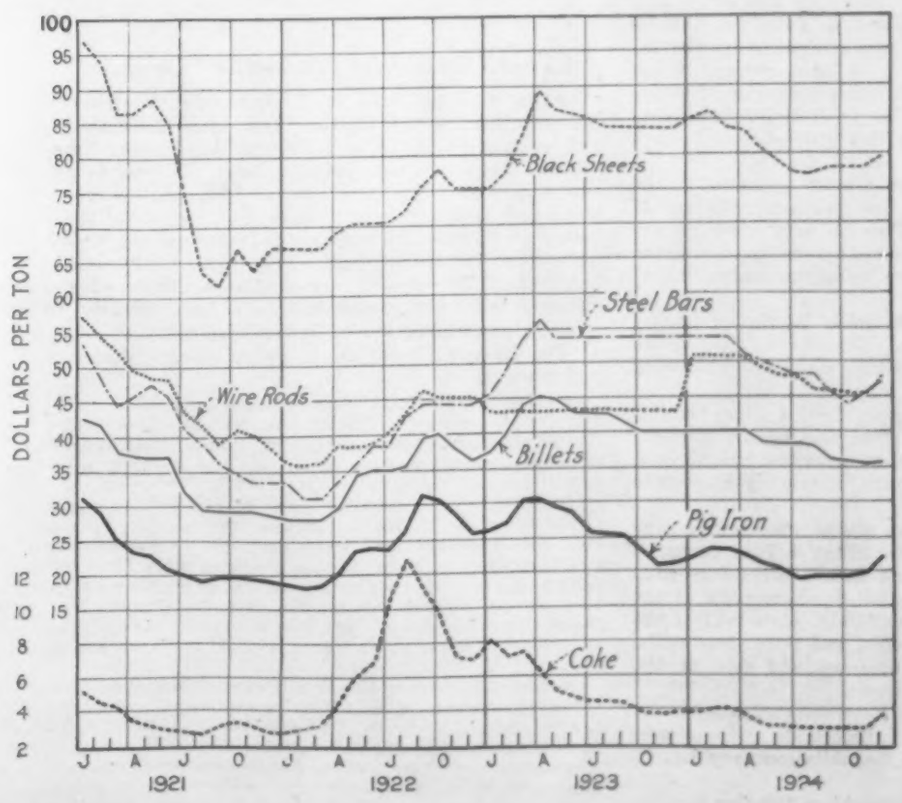



**Fig. 3. Price Trends in Iron and Steel**

The prices shown are averages of the weekly quotations appearing in THE IRON AGE

*occurred in 1922 extremely unlikely.*

The market for iron, however, is decidedly strong, and it is a fact that pig iron is still considerably lower with reference to steel than was the case in 1922 and early 1923. Certainly no lower prices are likely to be available for second quarter buying. The higher cost of coke and the relatively large spread between iron and steel make it even more certain that iron prices will advance than is the case with steel. Stocks of merchant pig iron, furthermore, are declining.

*It seems most probable that for the second quarter there will be moderate gains in the price of iron.* An advance of about $1 would seem reasonable in view of the present statistical position.

### Trend of Price Spreads

FIG. 3 gives a picture not only of the trend of the prices of important iron and steel items, but also of the varying spreads between those items. Some of the salient points are as follows:

It is noticeable that at present there is no definite stabilization of steel prices such as existed in the case of sheets, bars, and wire rods in 1923. Numerous readjustments in the price structure are in process.

At the end of 1924 pig iron showed the sharpest advance, with wire rods next. The least movement occurred in the case of billets. The price of billets was relatively low. The spread between black sheets and pig iron was less than in the early part of 1924, but much greater than in 1921 and 1922.

Judging by the relative trends of wire rods and steel bars, it would seem that the former are likely to advance further, and this conclusion is strengthened by the probability that the spring will bring a considerable demand for wire from farming sections. The railroad demand for wire products is also likely to continue good.

The advance in prices which have been occurring recently appears to be a correction of unduly low quotations, rather than a general uprush due to increased demand. Pig iron has been too low in comparison with costs and with finished steel. Wire rods have been low in comparison with bars. Black sheets have been low with relation to billets. These mal-adjustments have been reduced. It is likely that further changes of this character will take place during the early months of 1925.

While plates are still relatively low, it is rather probable that this condition will continue for a time, since the demand from both the oil industry and the railroads is not likely to increase. The tendency is to reduce oil production and the storage is already great. The existing supply of railroad cars is ample for the probable traffic.



## MORE ACTIVE PLANTS

### Operations in the Valleys Nearer Capacity Rate—Heavy Specifications

YOUNGSTOWN, Jan. 13.—This week steel production in the Mahoning and Shenango Valleys moves another notch nearer a capacity rate. Steel companies are receiving a liberal volume of specifications against contracts for rolled products placed last November and December, and are obliged to maintain an active production rate in consequence.

On Jan. 20, Tod blast furnace in the Brier Hill group of the Youngstown Sheet & Tube Co. will be blown in, to be followed shortly afterward by the resumption of Jeannette stack in the same group. These resumptions will give the Youngstown district 33 active stacks of 45, and will leave the Sheet & Tube company but one idle blast furnace in this district, No. 2 stack in its Hubbard group.

This week, 75 of 82 open-hearth furnaces in the Youngstown district proper, are melting, including 47 of 52 independent units. This is very close to the theoretical capacity of open-hearth departments in the district. Bessemer plants are being maintained at 85 per cent.

Of 127 sheet and jobbing mills in the Mahoning Valley, 110 are under power. The Sharon Steel Hoop Co. has started three mills which were idle one week because of mechanical difficulties.

The plate mill of the Republic Iron & Steel Co. has been placed in commission, after one week's idleness. The 12-in. bar mill at East Youngstown of the Sheet & Tube company is on double turn, operating heretofore intermittently single turn.

The Republic company has placed one lapweld pipe mill on its inactive list, but the Sheet & Tube company has offset this loss by starting a unit heretofore cold. In this district, the only inactive finishing mills of the Sheet & Tube company are its 110-in. plate mill at the Brier Hill works, two tube mills, and four sheet mills, including two at East Youngstown and two at the Western Reserve works, Warren.

The only idle units of the Republic company, in its finishing department, are two sheet mills and one tube mill. At its Niles plant, the Republic company has 16 sheet mills rolling.

Companies which are approaching 100 per cent in production are the Trumbull Steel Co., Sharon Steel Hoop Co., A. M. Byers Co. at its Girard works, the Falcon Steel Co. and the Mahoning Valley Steel Co.

Among the non-integrated sheet rollers, the Newton Steel Co. has 14 of 20 sheet mills under power, and the Thomas Sheet Steel Co., 11 of 12.

Hot strip, merchant bar and puddling departments are producing at a near-capacity rate.

In this district, subsidiary interests of the Steel Corporation are operating sheet, tin plate and wire capacity at an 80 per cent average.

Following a period of restricted operations during the inventory taking, the fabricators are gradually getting back into normal production again.

## Eastern Industrial Advertisers Organize

At a meeting held in Philadelphia, Wednesday evening, Jan. 7, the Eastern Industrial Advertisers, a division of the National Industrial Advertisers Association, was organized. Membership is confined to advertising and sales executives of industrial corporations and associations that have inter-industrial marketing problems. The members will meet on the second Thursday of each month and also hold weekly luncheons. The objects are similar to those of the national body with which it is affiliated. Nearly 40 were in attendance at the initial meeting.

The division elected the following officers, directors and committees:

President, W. S. Hays, National Slate Association, Philadelphia; vice-president, N. S. Greensfelder, Hercules Powder Co., Wilmington, Del.; secretary, D. J. Benoliel, International Chemical Co., Philadelphia; treasurer, L. R. Barnard, Leeds & Northrup Co., Philadelphia.

Directors: W. A. Austin, Baldwin Locomotive Works, Philadelphia; R. D. Black, Black & Decker Co., Towson, Md.; J. D. Capron, United States Cast Iron Pipe & Foundry Co., Burlington, N. J.; F. Dunlap, Diamond State Fibre Co., Bridgeport, Pa.; H. D. Elvidge, Martin Parry Corporation, York, Pa.; A. F. Hartranft, Reading Iron Co., Reading, Pa.; Joseph Rhoads, J. E. Rhoads & Sons, Philadelphia; R. J. Wood, Autocar Co., Ardmore, Pa.; S. H. Yorks, Bethlehem Steel Co., Bethlehem, Pa.

Membership Committee: E. S. Carley (chairman), E. I. duPont de Nemours & Co., Wilmington, Del.; L. W. Arny, Leather Belting Exchange, Philadelphia; D. J. Benoliel, International Chemical Co., Philadelphia.

Program Committee: W. A. Austin (chairman), Baldwin Locomotive Works, Philadelphia; C. L. Simon, Brown Instrument Co., Philadelphia; H. F. Marshall, Warren Webster & Co., Camden, N. J.

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Percentage of defective castings reduced by daily analysis of causes of rejects.—Page 195.

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"An attack on industry" is characterization of Interstate Commerce Commission's refusal to permit assignment of private freight cars.—Page 197.

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New industrial building construction in 1924 was 22 per cent under 1923 in 36 eastern States. Total for all classes of new construction over 4.5 billion dollars for year, 12 per cent over 1923 and a new high record. —Page 211.

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Steel output gains 10 per cent in December, with daily production of 136,609 tons, 78.5 per cent of capacity.—Page 217.

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Will steel industry operations in excess of 80 per cent of capacity represent over-production?—Page 218.

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Hand labor cut to a minimum in highly specialized production foundry. Three men pour 85 tons of metal per working day. Rate of output one ton of castings for 1¼ men.—Page 187.

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Lower pig iron prices for second quarter unlikely, but large stocks of merchant pig and high level of production make sharp price advances improbable.—Page 219.

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Conditions causing prosperity largely temporary, says General Fireproofing Co. head. Warns against over-expansion when improved conditions do not promise more than six months of prosperity.—Page 192.

Expert calculates average cumulative labor cost in wholesale value of commodities is fully 80 per cent of total.—Page 198.

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Sharp gain in Steel Corporation's unfilled orders. Dec. 31 total 4,816,756 tons, 20 per cent above previous month.—Page 192.

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One billion dollars a year may be saved the country by Bureau of Standard's simplification work, Bureau official estimates.—Page 202.

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Freight carloadings in 1924 totaled 48.5 millions, 2.6 per cent under 1923. —Page 211.

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"A plant properly equipped with the latest production tools, which still depends on hand labor to move material to and from the production tools is not properly balanced."—Page 215.

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Value of food consumed by average Philadelphia workman twice that by London wage earner, and seven times that by Lisbon worker.—Page 215.

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Symbols suggested as time savers in collecting blast furnace research data.—Page 203.

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Average gain in United States population in last four years surprisingly large; 1,778,750 a year. Though population increase indicates steel output of 36.6 million tons in 1925, physical conditions point to output of much more than 40 million tons.—Page 225.

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The black sheep in business can be attended to by the Department of Justice. Federal Trade Commission not needed.—Page 224.

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## GUESTS OF PRESIDENT COOLIDGE

### Judge Gary and Others Urge Enforcement of Prohibition and All Other Laws

WASHINGTON, Jan. 13.—Judge Elbert H. Gary, heading a group of other prominent citizens as members of the Citizens Committee of One Thousand for Law Enforcement, at a breakfast at the White House on Thursday of last week presented resolutions requesting the President and the governors of the States to join with the committee in the enforcement of law of the land. President Coolidge, in a speech to his guests, denounced all violators of the prohibition law. Judge Gary, at a luncheon given to members of the committee by Washington business men, also strongly attacked violations of the law. He said:

"It's a harsh thing to say, but less than stating the whole truth if we do not admit that many of us are sufficiently selfish to insist at times that we have the right to discriminate between the different laws of the land. And, if I were to specify, I would not point my finger to you or at you, but I would point my finger at myself.

"I am not here to make confessions, but I am sufficiently sincere to admit the truth. But I think all of us must admit that if we are to continue civilization in this country and in the rest of the world, it is on the basis of everyone of us doing his best to see that all of the laws are observed."

Mr. Gary declared that it would not be possible to set an example for others unless those who sought to lead could demonstrate that they were free of guilt themselves. Continuing, he added:

"This country never before has had so good a prospect of success and prosperity as it has on this very day. There are many reasons for that. In the first place, let me say that in addition to the natural resources and blessings of the country we have an administration at the seat of government that was never better than it is at the present time.

"The man who is heading this nation, by surrounding himself by men honest, faithful and capable and by his daily walk and conversation, is exerting an influence in the country and in the world that is of substantial benefit to every living person."

Judge Gary referred to President Coolidge as being "not only wise, great, learned and strong, but simple." He declared that in his judgment "President Coolidge gives no consideration to political effect."

## MAY REQUIRE REFUND

### Millions of Dollars in Taxes on Ore Properties Involved in Case in Supreme Court

WASHINGTON, Jan. 13.—Constituting a test case, the outcome of which will determine whether or not the Federal Government will be required to refund $30,000,000 in taxes to lessees of iron ore properties, argument was made in the Supreme Court of the United States last week in a proceeding brought against the Allworth-Stephens Co. Technically the plaintiff is Margaret C. Lynch, executrix, wife of the late E. J. Lynch, the latter having been collector of internal revenue for the District of Minnesota, against whom suit had been filed by the company for tax refunds.

The respondents are Henry Stephens and Albert L. Stephens and Marshal H. Alworth, Duluth, Minn. The Messrs. Stephens gave a ten-year lease on 8000 acres of iron ore on the Mesabi Range of Minnesota to Mr. Alworth. The case concerns construction of Section 12 of the revenue act of 1916, granting, in the case of mines, "a reasonable allowance for depletion" as a deduction from gross income. The particular question is whether this allowance can be claimed by a lessee of mining properties under the provisions of the act. The company in computing its taxable income for the year 1917, according to the Government attorneys, including Solicitor General James M. Beck, and Merrill E. Otis, special assistant to the Attorney General, was not entitled to deduct as depletion any value of the ore belonging to the fee owner of the mine which was mined and removed during 1917. Attorneys W. D. Bailey and Horace Andrews, appearing for the company, maintained that the company was entitled to deduct for depletion. The Circuit Court of Appeals for the Sixth Circuit, it was pointed out by attorneys for the Government, have held that a lessee is not entitled to the allowance, the decision being that of Weiss, Collector, vs. Mohawk Mining Co. However, in the Alworth-Stephens case the Circuit Court of Appeals for the Eighth Circuit refused to follow the rule laid down in the Mohawk case.

According to attorneys for the Government, if the decision of the Circuit Court of Appeals in the Alworth-Stephens case is correct, approximately $30,000,000 worth of taxes collected must be refunded to mining interests. By reason of this the case has assumed considerable importance. In substance it is the position of the Government that correct interpretation of the revenue act of 1916 shows that the allowance for the exhaustion (depletion) of mines was considered to apply only to the owner of the property. To support this contention, the Government attorneys referred to the revenue act of 1918, which carried new provisions apportioning the deduction for depletion between lessor and fee owner of mining property. At the same time, attorneys for the respondents insisted that the Act of 1916 already provides for this apportionment which was claimed for the company.

## Rates on Iron and Steel from Pittsburgh to Woodlawn Declared Unreasonable

WASHINGTON, Jan. 13.—Rates on iron and steel articles in carloads and less than carloads, from Pittsburgh and Woodlawn, Pa., to Williamson, W. Va., since June 5, 1922, were unreasonable to the extent that they exceeded 39c. per 100 lb. in carloads, and 55c. in less than carloads, prior to July 1, 1922. They were unreasonable to the extent that they exceeded 35c. in carloads and 49.5c. in less than carloads since July 1, 1922, according to recommendations made to the Interstate Commerce Commission in a report by Examiner Paul O. Carter. Rates of 47.5c. in carloads and 56.5c. in less than carloads after July 1, 1922, and 52.5c. in carloads and 62.5c. in less than carloads prior to that date, applied to the shipments dealt with and which were made the basis of a complaint by the traffic bureau of the Williamson Chamber of Commerce.

The examiner held that the rates are unduly prejudicial as compared with rates to Kenova and Huntington, W. Va. In the same decision the examiner held that class rates and commodity rates bearing a direct relation thereto from points in central and border territories to Williamson, are unreasonable. Award of reparation was recommended in connection with the shipment of steel articles from Pittsburgh to Woodlawn.

## To Study Aircraft Situation

A committee has been appointed by the American Engineering Council to inquire into all phases of air navigation, particularly air mail, commercial flying, and national defense. Joseph W. Roe, professor of industrial engineering, New York University, New York, is chairman.

A large group of related questions will be taken up, the economic and industrial possibilities of aircraft being a central problem. The most feasible air routes from an economic standpoint will be sought out, and special studies made of topographic and climatic conditions. The report of the committee will be submitted to the council, and the findings, it is expected, will be used as a guide to the council's future policy in the field of aeronautics.

ESTABLISHED 1855

# THE IRON AGE

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Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President* — PRINTED IN U. S. A. — George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, *Pres.* A. C. Pearson, *Vice-Pres.* F. J. Frank, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: Guardian Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

## A Square Deal for Business

THE next administration of President Coolidge, who becomes our chief executive by specific election, has an unmistakable mandate from the people. By virtue of that it will institute reforms. Among them will be better adjustment of our method of taxation and a more genial spirit toward business, big and little. The man of business will no longer be viewed *ipso facto* as a criminal, or a near-criminal.

The last thought inspires the hope that steps may be taken to abolish the Federal Trade Commission. We think that such an abolition would be applauded by business men. Reduced to the baldest terms, the theory of the commission was that business is crooked and requires a policeman. There are some black sheep among business men, but most of them are honorable and policing is unnecessary. Just for that reason it becomes officious and harassing.

For attention to the black sheep there is always the Department of Justice, whose affair they properly are. But the Department of Justice itself needs to be reformed. Its bullying of the copper producers two or three years ago, for example, would not stand very much looking into. In recent years, in fact, business has been terrorized by the Federal Trade Commission and the Department of Justice, sometimes by one, sometimes by the other, sometimes by the two together. The honest man does not like to be the victim of indictment, nor does he like to be put to the expense of defending himself. Honesty has been no immunity. Rather, the question has been of avoiding what bureaucrats disliked and escaping their ambitions to make reputations for themselves.

Take the matter of trade associations, which is still unsettled. Under Attorney General Daugherty it was the policy, as we see it now, to bring only such suits as the Department of Justice thought it could win, that being the way toward legal reputations. Apparently Attorney General Stone's intention has been, on the other hand, to bring test cases in order that the Supreme Court may prescribe what are rules of reason. On the face of it the latter will be a commendable procedure, which indeed we have previously recommended, but we must agree that it will be uncomfortable and expensive for the citizens who are selected to be the goats. It would be the square deal if Congress should enact a law for the indemnification of defendants in test cases wherein the Department of Justice loses.

For that matter, there are numerous things that Congress might do in order to give business men a square deal. There is hope now that Congress will be looking in that direction, seeing that the people have expressed the opinion that it is by business being done that they get their living, and that it is a poor idea to impose handicaps in the form of government ownership, too much governmental regulation and other socialistic experiments.

## Rate of Gain in Steel Demand

THE fact that the population of the United States increased at a greater rate after 1920 than in the ten years before was brought out by a careful study completed last June by the National Bureau of Economic Research. Increase in population is one factor in our increasing steel demand and a precise application of this finding to the current steel situation should be of interest.

After presenting its study, based on arrivals and departures, birth and death statistics, etc., the bureau remarked: "It appears, then, that the average gain during the last four years was 1,778,750 a year as compared with an average increase of 1,418,100 during the decade 1910 to 1920."

The two greatest pre-war years in steel production were 1912 and 1913, each showing about 30,275,000 tons of ingot production. This may be assumed as the practical maximum before the war. What the steel industry needs, therefore, for an appraisal of possibilities in the year 1925, is a comparison between conditions Jan. 1, 1913, the middle of the 1912-1913 period, and July 1, 1925, the middle of the present year.

Population Jan. 1, 1913, may be estimated from census figures at 95,800,000 for continental United States. The latest figure of the National Bureau

of Economic Research is 112,826,000 for Jan. 1, 1924. A gain in the year and a half following equal to the gain in the year and a half preceding would make the population 115,750,000 on July 1, 1925. Certainly this is a much higher figure than would be guessed, and the careful work of the bureau is therefore of all the more interest and value.

The increase, Jan. 1, 1913, to July 1, 1925, is almost precisely 21 per cent, or just the same percentage gain as occurred in the decades 1890 to 1900 and 1900 to 1910. Our population has been increasing less rapidly than formerly on account of restricted immigration, but on account of changes in the relation of births and deaths as large a percentage increase seems to occur in these 12½ years as formerly occurred in 10 years.

Everything else being equal, therefore, given the same conditions except for the increase in population, the 30,275,000 tons of ingots for 1912 and 1913 would mean 36,633,000 tons of ingots in 1925.

Assuming that money conditions and general business conditions are the same, four other important factors, besides population, affect steel demand: (1) Supplanting of other materials by steel; (2) Progress in industry generally; (3) Progress in steel use, whereby a given amount of work applies or utilizes more steel; (4) The assiduity with which men are willing to work.

Supplanting of other materials by steel was a very large factor for years in contributing to the remarkably rapid increase in the rate of steel consumption. Now the factor is relatively a minor one. As to progress in general industry, that is occurring now, particularly in water power development, but is perhaps not so rapid as before the war. In the third item, improvements in using or applying steel, progress is continuous. Metal-working machinery, cranes, lifting magnets, cutting and welding apparatus and a host of appliances are either being improved or are being more generally adopted. As to the fourth, willingness to work, that went far down in 1919 and 1920, but there has since been recuperation, and if a so-called "labor shortage" is avoided in 1925 by investors not trying to spend too much money, there will be further improvement.

When, with 30,275,000 tons of ingots in 1912-1913, mere increase in population indicates 36,633,000 tons in 1925, the combination of the other four factors, everything else being equal, points to more than 40,000,000 tons in 1925. Physical conditions will allow 1925 to be a very good year in steel, and it only remains to be seen whether other conditions will permit the physical conditions to be effective.

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A NEW electric steel furnace record was made in 1924 in that there were more contracts for new installations of melting units than in any year since the war. The total was at least 40, though unfortunately the statistics as given in THE IRON AGE of Jan. 1 are not complete. Mere numbers of furnaces mean little unless the size and the application are known. A large number are probably steel foundry melting units, and some are intended for gray iron melting and refining, a use that is gaining rapidly in favor. Conservative estimates put the total of electric melting units in the steel and iron industry in this country now at about 450—a remarkable advance from the 19 furnaces reported in 1913. In a fairly spectacular way the American electric steel industry has advanced to world leadership.

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## Automobiles and the Metal Industry

THE silver anniversary of the automobile, celebrated last week in New York by the annual exposition, carries significance also to the steel and non-ferrous metal industries. Twenty-five years ago the automobile was practically a non-consumer of steel or other metals. In the last three years an average of 10 per cent of the country's finished steel output has gone into the automotive industry, according to THE IRON AGE'S yearly analyses; close to 8 per cent of the American copper output for the same year, while the tin contained in motor car bearings ran into substantial figures.

In one direction the automobile industry has been a creative factor in metallurgy. Much, but by no means all, the steel which goes into it is sheets. It has developed no small demand for alloy steels. Only 15 years ago alloy steel making was in its infancy and the more prominent steels of today were almost unknown. Today about four times as much alloy steel is produced, and it is well recognized that without the automobile the more complicated steels would have come on more slowly.

Prophecy may well be restrained in respect to the automobile saturation point. In percentage of steel consumed there has been little change in the last three years—10 per cent in 1922, 11 per cent in 1923 and 9 per cent in 1924. Lighter and smaller cars using more alloy steel may come, but many signs point to a relatively larger increase of vehicles of the air.

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## The Law and the Individual

IN the resolutions presented to President Coolidge on behalf of the Citizens Committee of One Thousand in Favor of Law Enforcement emphasis is put in the right place in urging that all officials not only do their utmost to enforce the law but also "by precept and personal example" assist in maintaining among the citizens of the republic "the high determination to obey and enforce the law of the land." The private citizen, however, cannot demand that an official pursue any course which he himself is not willing to adopt. A citizen who blames officials for violations of the law while he himself patronizes the bootlegger is just as much of a lawbreaker as the bootlegger.

At banquets and other public functions the decrease in the open serving of intoxicating liquors has been significant in recent years, but drinking in banquet halls and in hotel rooms continues and has been carried so far that the results of excessive indulgence have marred the pleasure of such occasions for many guests. Until all who attend public dinners are willing to forego entirely the illegal use of intoxicants, manufacturers and others

who are earnestly trying to bring about law enforcement will be heavily handicapped and embarrassed. The activities of organizations and officials will not go far unless the individual does his full part.

## Statistics of Efficiency

WE have been dealing much more in business statistics since the war than formerly, and this is particularly the season of year for statistics. It is a good time to reflect on their value. What use can be made of them, and how can the field of information be enlarged?

Broadly, the principal things we want to know are what industrial progress the United States has made to date, and what are its prospects for progress? The consideration, of course, is of material progress, not of the amount of information we have acquired or the level of ethical standards.

It will hardly be denied that the best index of material progress in the past would be a record of the inventory of our national wealth, preferably annual, but of some long range value if only decennial. Yet the only continuous attempt in that direction has been the Census Bureau statement of the "national wealth," and it is admittedly quite inadequate. It is based largely upon appraisals made by the taxing authorities, which are notoriously opportunist in character and quite lacking in the uniformity that is essential.

Most useful, as indicating the degree of our activity, would be a statement of the national income. This we have by the National Bureau of Economic Research for the years 1909 to 1919 inclusive, but that is not up to date. Current estimates are sometimes made, but they do not come from original sources. One, for instance, is computed from index numbers of commodity prices and statistics of production.

What would be most useful to the business man is information as to our efficiency. In one sense it is not so much the quantity of work as the quality of work that counts as an augury for the future. We may have figures from one source as to how many men were on the payrolls, on an average, in a month or a year, and from another source we may have information as to how much copper or pig iron was produced or how many automobiles or bath tubs.

The two classes of information do not lend themselves at present to statistical relation. The more useful information would tell how much is being produced in proportion to the capacity that is engaged and the amount of workmen's time that is being paid for.

Another useful piece of information would be supplied by the relation between productive activity and increase in physical wealth. When we have done a certain amount of work in a year, how much have we to show for it? We may have produced a certain number of automobiles and worn out the same number, so that we should not be ahead; or we may have built more dwelling houses than is represented by the destruction and depreciation, in which case we should be ahead by the difference.

Considering the enormous amount of work now being done in gathering statistics, it is to be hoped that more effort will be made so to relate the statistical activities that some deductions can be made as to our efficiency, how much of physical things we have accumulated to date and the rate at which we are now accumulating.

### The Iron Age and Its Readers

SECRETARY HOOVER, in his recent statement in regard to business conditions, said:

"As a nation, our business men, bankers and public officials have gained enormously during the past four years in understanding of the basic factors which create healthy prosperity as distinguished from over-expansion, as well as in understanding of their responsibilities in the matter. Our informational services are now upon a basis of quickly detecting dangerous currents."

THE IRON AGE in its business analysis and forecast section, conducted by Dr. Lewis H. Haney, director New York University Bureau of Business Research, assists the business man, not only in detecting dangerous currents, but also in determining favorable conditions and prospects. Service of this kind, if it does not adventure too far into prophecy, is of great value, and we are confident our readers will find Dr. Haney's articles meeting their wants uncommonly well.

## Proposed Simplification of Sheet Steel Sizes Makes Further Progress

CHICAGO, Jan. 13.—Thirty-five producers representing 100 per cent of the sheet capacity of the country and over 80 per cent of the jobbers and distributors of sheets have formally accomplished the proposed simplification of sheet steel sizes known as the jobbers' schedule, according to what is believed to be a thoroughly reliable report. The schedule was drawn up by a committee of the sheet steel industry headed by Walter C. Carroll, vice-president Inland Steel Co., Chicago, and was indorsed by the Division of Simplified Practice, Department of Commerce. There is apparently every prospect that there will also be a 100 per cent acceptance by the jobbers; in fact, the jobbers' associations have been very emphatic in urging strict adherence by the mills to the simplified schedule. In May, a board of review of which Mr. Carroll is chairman, will pass upon suggested changes in the schedule received during the prior six months. The entire schedule, as now recommended, will be embodied in an official bulletin which is now being prepared by the Division of Simplified Practice. The jobbers' schedule is only the first step in sheet steel simplification.

Automobile manufacturers are now at work on the simplification of automobile body sheets and will submit their recommendations to the Division of Simplified Practice, which will then confer with the board of review with a view to bringing the automobile industry and the sheet mills to an agreement on what will constitute the automobile schedule. A barrel schedule will be prepared in the same manner and other special products will come up for consideration.

## MACHINE TOOL DEALERS

### Organization Completed at Cincinnati—Name and Officers Selected

CINCINNATI, Jan. 13.—The Associated Machine Tool Dealers, an organization of machine tool dealers exclusively, completed its organization at Cincinnati, Jan. 12, by adopting a constitution and by-laws, and electing officers for the ensuing year.

The association, which is composed of executives of member firms, or companies, of which about 40 are eligible, plans to work in close cooperation with machine tool builders for the betterment of the industry. Meetings of the Associated Machine Tool Dealers will be held simultaneously with those of the National Machine Tool Builders' Association.

Officers elected were:

President, George E. Merryweather, Motch & Merryweather Co., Cleveland.

Vice-President, Marshall Prentiss, Henry Prentiss & Co., New York.

Secretary, Tyler Carlisle, Strong, Carlisle & Hammond Co., Cleveland.

Treasurer, George H. Cherrington, Brown & Zortman Machinery Co., Pittsburgh.

Directors, in addition to the officers, Charles E. Busch, Charles Strelinger Co., Detroit; L. H. Swind, Swind Machinery Co., Philadelphia; J. R. Vandyck, Vandyck Churchill Co., New York; J. W. Wright, Colcord-Wright Machinery & Supply Co., St. Louis, and W. J. Radcliffe, E. A. Kinsey Co., Cincinnati.

## Will Apply for Joint Rail and Water Freight Rates Between Pittsburgh and Memphis

Joint rail and water freight rates between Pittsburgh and Memphis, Tenn., on iron and steel products are to be applied for by the Inland Waterways Co., Pittsburgh, and the Louisville & Nashville Railroad and it is expected that the Illinois Central Railroad and the Southern Railroad will concur in the request. Commodities named in the draft of the proposed tariff are those manufactured by the Pittsburgh Steel Co., which, lacking barges and towboats of its own, uses the rivers for shipments in the barges of the Inland Waterways Co. This is part of the effort of Pittsburgh steel companies to free themselves of the all rail freight disadvantage into the West and Southwest created by the abolishing of Pittsburgh as a sole basing point on finished steel prices. The natural destination of shipments by the inland waterways from Pittsburgh mills is Memphis, which is one of the great railroad terminal points of the country. But the rivers are navigable to that point only for brief periods of the year and as the locks and dams that will permit all the year round navigation as far as Louisville are nearing completion, a rail and river tariff is sought that will enable Pittsburgh mills to get to Memphis all through the year. A considerable saving over the all rail rate to Memphis will be made possible by the joint river and rail rate.

## San Francisco Molders Strike Against American Plan

SAN FRANCISCO, Jan. 8.—One hundred iron molders have walked out of the three plants operated by the Enterprise Foundry Co. Two of the Enterprise foundries are in this city, one at Nineteenth and Alabama Streets and the other at Fremont and Folsom Streets. The third plant is in South San Francisco. The reason for the walkout is the opposition of the molders to the "American Plan" or open shop policy recently inaugurated by the Enterprise Foundry Co., of which Charles Hoehn is president.

Arthur R. Burns of Cincinnati, vice-president of the Molders' Union, is here in charge of union activities. The walkout so far has been attended by no disorder, and the strikers have been replaced by other molders. Armed guards and extra police, however, are guarding the plants.

"Some of the molders who walked out had been with the Enterprise Foundry Co. 20 years," Charles Hoehn, president of the company, stated, following the walkout. "We told the men that we would like to have them stay," he said, "but many of them told us they were afraid to stay. Under the 'American Plan' the molders would have received the same pay, and worked the same number of hours, as under union rules."

There are 35 foundries in the San Francisco bay region, employing about 1500 molders, and half of that number are already operating under the "American Plan." Several plants that are not under that plan at present intend to inaugurate it in the near future.

The Enterprise Foundry Co. has been established in San Francisco since 1885, and employs 300 men in three plants. It manufactures iron, brass and steel castings.

## Company Develops New Products

During the past two years, a gradual change has taken place in the form of production of the Youngstown Pressed Steel Co., at Warren, Ohio, a subsidiary of the Sharon Steel Hoop Co., primary steel maker of Sharon, Pa. Whereas a considerable part of the productive capacity of the Warren company had been devoted to the manufacture of parts for automobiles, the output has been diversified, so as to include a wider range of products, for which there is more general year-round demand.

After several years of experimentation and research, the company has just developed a new corner bead. Much of its current pressed steel production is running to cases for gasoline pumps, which in their finished form consist of one standard. The Youngstown Pressed Steel Co. is now one of the chief makers in the country of the steel shells used in manufacture of visible gasoline pumps.

It is also producing a steel jacket for water pumps in large numbers, tops and legs for stoves, heads for metal barrels and containers of various kinds. The company finds a more uniform demand for products of this nature than for parts entering into motor car manufacture, which presented the problem of seasonal production.

## Electric Furnace Installed for Alloy Steel Castings

The Michigan Steel Casting Co., Detroit, announces that it has purchased a 1-ton Heroult electric furnace which is to be used for special alloy work. During the last six years the company has been developing a chrome-nickel alloy steel casting which it sells under the name of Misco. This business has grown so large that the company finds it necessary to install a separate melting unit and to establish a separate foundry to take care of this business.

## Expansion of Cement Plant

The Phoenix Portland Cement Co., now manufacturing 1,500,000 bbl. of cement annually at its plant at North Birmingham, plans to add equipment which will increase capacity to 2,000,000 bbl. Lindley C. Morton, president, said that the company "has authorized an increase in capital stock to $4,000,000, and is now prepared to proceed with its proposed new plant at New Orleans. The company has also completed plans for the immediate construction of an addition to the Birmingham plant, which will increase its output to 2,000,000 bbl. annually." Contracts for the necessary machinery and equipment for the addition are being let and work will be started immediately. This addition will be in operation by July 1, making the Birmingham plant of Phoenix company the largest cement plant in the south.

Samuel H. Gardner, district attorney for Allegheny County, will be the speaker at the regular monthly dinner and meeting of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Pittsburgh, Monday evening, Jan. 19. His subject will be, "Crime and its Causes."

# European Markets Show Less Buoyancy

## Heavy Costs Obsess All—Franco-German Negotiations Fail and Tariff War Impends—French Frankly Pessimistic

*(By Cablegram)*

LONDON, ENGLAND, Jan. 12.

DOMESTIC demand for pig iron is moderate, but export demand still poor, the position being generally unchanged. Bolckow, Vaughan & Co., Ltd., Middlesbrough, have relighted one foundry furnace. Hematite is dull, with further price concessions probably obtainable. Gjers, Mills & Co., Ltd., Middlesbrough, have blown in two hematite furnaces at Ayresome. This makes 43 Northeastern furnaces of all kinds now blowing, the list comprising 14 foundry and forge, 13 hematite and 16 furnaces working on special irons.

Foreign ore is quiet, buyers awaiting developments before committing themselves beyond their minimum requirements, which already are filled. Sellers of Bilbao Rubio ore ask 22s. 6d. to 22s. 9d. ($5.39 to $5.45), c.i.f. Tees.

Finished steel is dull. Most works have resumed operations, but some makers, anxious for prompt specifications, are willing to shade their prices. Forward selling is not entertained, except at advanced figures, owing to uncertainties of future costs.

December exports of pig iron aggregated 43,952 tons, including 7083 tons to the United States. The total of iron and steel exports aggregated 303,057 tons.

### Sheets and Tin Plate

Tin plate demand is improving, with some fair sales, especially to Far Eastern markets. Most makers are still sellers at the schedule. Considerable friction continues, caused by the attitude of a South Wales corporation toward the merchants. Meetings have been held and there is a possibility of independent mills making special terms with the merchants. Cooperating with big oil interests, Baldwins, Ltd., is reported intending to erect 16 new mills at Swansea, Wales, but confirmation is lacking.

Galvanized sheets are quiet.

Black sheets are dull and quiet.

### On the Continent of Europe

Continental markets are strong. South America is reported a good buyer direct. Japan is inquiring for good tonnages of wire and India wants material, but the offers generally have been unacceptable. Consumers in Great Britain are not anxious buyers, being well covered.

Franco-German commercial negotiations have broken down, no agreement having been reached regarding the question of importation of French steel into Germany when the Versailles treaty clause lapsed on Jan. 10. There is grave possibility that a tariff war may develop between France and Germany. The outlook is highly obscure.

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## GERMANY EXPECTS IMPROVEMENT

### Iron and Steel Syndicates Tied Up with Tariff Questions and Franco-German Commercial Treaty—1924 Was Unsatisfactory

BERLIN, GERMANY, Dec. 29.—For the German mining and metal industries 1924 as a whole was unsatisfactory, but it ended with an improvement. The coal industry was entirely lamed by a month-long strike in May, and after that it suffered from a bad selling market. Three reductions in railroad rates, and a 20 per cent cut in coal prices in July, followed by a 10 per cent cut in October, helped very little; and operations entirely ceased in many mines on the southern edge of the Ruhr. Not until the beginning of December was there any sign of improvement.

The Western heavy iron and steel branches suffered

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**British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.78 per £1, as follows:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Durham coke, del'd. | £1 | 5s. | | | $5.98 | | |
| Bilbao Rubio ore† | 1 | 4 | | | 5.74 | | |
| Cleveland No. 1 fdy. | 4 | 6 | | | 20.55 | | |
| Cleveland No. 3 fdy. | 4 | 1 | | | 19.36 | | |
| Cleveland No. 4 fdy. | 4 | 0 | | | 19.12 | | |
| Cleveland No. 4 forge | 3 | 19½ | | | 19.00 | | |
| Cleveland basic | 4 | 0 | | | 19.12 | | |
| East Coast mixed | 4 | 7½ | | | 20.91 | | |
| East Coast hematite | 4 | 19 | to £5 | 0s. | 23.66 | to | $23.90 |
| Ferromanganese | 15 | 0 | to 15 | 5 | 71.70 | to | 72.90 |
| *Ferromanganese | 15 | 0 | to 15 | 5 | 71.70 | to | 72.90 |
| Rails, 60 lb. and up | 8 | 10 | to 9 | 0 | 40.63 | to | 43.02 |
| Billets | 7 | 0 | to 8 | 0 | 33.46 | to | 38.24 |
| Sheet and tin plate bars, Welsh | 8 | 7½ | | | 40.03 | | |
| Tin plates, base box | 1 | 3½ | | | 5.62 | | |
| | | | | | C. per Lb. | | |
| Ship plates | 9 | 0 | to 9 | 10 | 1.92 | to | 2.03 |
| Boiler plates | 13 | 0 | to 13 | 10 | 2.77 | to | 2.88 |
| Tees | 9 | 2½ | to 9 | 12½ | 1.95 | to | 2.05 |
| Channels | 8 | 7½ | to 8 | 17½ | 1.79 | to | 1.89 |
| Beams | 8 | 2½ | to 8 | 12½ | 1.73 | to | 1.84 |
| Round bars, ¾ to 3 in. | 9 | 7½ | to 9 | 17½ | 2.00 | to | 2.11 |
| Galv. sheets, 24 gage | 17 | 0 | to 17 | 10 | 3.63 | to | 3.73 |
| Black sheets, 24 gage | 12 | 10 | to 12 | 15 | 2.67 | to | 2.72 |
| Black sheets, Japanese specifications | 15 | 5 | | | 3.25 | | |
| Steel hoops | 10 | 15 | and 12 | 10* | 2.29 | and | 2.67* |
| Cold rolled steel strip, 20 gage | 16 | 0 | | | 3.41 | | |

*Export price.
†Ex-ship, Tees, nominal.

### Continental Prices, All F. O. B. Channel Ports

| | | | | | |
|---|---|---|---|---|---|
| Foundry pig iron: (a) | | | | | |
| Belgium | £3 | 16s. | to £3 | 17s. | $18.16 to $18.40 |
| France | 3 | 16 | to 3 | 17 | 18.16 to 18.40 |
| Luxemburg | 3 | 16 | to 3 | 17 | 18.16 to 18.40 |
| Basic pig iron: (a) | | | | | |
| Belgium | 3 | 15 | | | 17.93 |
| France | 3 | 15 | | | 17.93 |
| Luxemburg | 3 | 15 | | | 17.93 |
| Billets: (a) | | | | | |
| Belgium | 5 | 5 | | | 25.10 |
| France | 5 | 5 | | | 25.10 |
| Merchant bars: | | | | | C. per Lb. |
| Belgium | 6 | 0 | | | 1.28 |
| Luxemburg | 6 | 0 | | | 1.28 |
| France | 6 | 0 | | | 1.28 |
| Joists (beams): | | | | | |
| Belgium | 5 | 15 | | | 1.23 |
| Luxemburg | 5 | 15 | | | 1.23 |
| France | 5 | 15 | | | 1.23 |
| Angles: | | | | | |
| Belgium | 6 | 0 | | | 1.28 |
| ⅜-in. plates: | | | | | |
| Belgium | 7 | 2½ | | | 1.52 |
| Germany | 7 | 2½ | | | 1.52 |
| ⅝-in. ship plates: | | | | | |
| Luxemburg | 7 | 2½ | | | 1.52 |
| Belgium | 7 | 2½ | | | 1.52 |

(a) Nominal.

during nearly the whole year from a weak buying market, aggravated by French, Belgian and Luxemburg competition. Prices during part of the year did not cover production cost. Bars rose until the end of April, when they touched 150 gold marks per metric ton, but fell in October to 110 marks. The improvement brought by the Dawes Reparations settlement was at first very slight, but in December began a new period of activity for semi-finished materials and rolling mill products and at the end of the year many works had orders for three months ahead.

Conditions in the metal-consuming industries, in particular machinery, were unsatisfactory throughout the year. The German Upper-Silesian concerns suffered badly. More than half the blast furnaces were blown out; and though the demand for Silesian pig iron somewhat increased late in the year only 6 blast furnaces out of 15 were being operated in December.

### Expect Better Conditions in First Quarter

The improvement of the last weeks is expected to continue during the first months of 1925. Prices are likely to rise. The Ruhr coal masters have been obliged to concede a 9 per cent increase in wages, and an increase in coal prices is under consideration. Wages now amount to between 57 and 63 per cent of the selling price of coal; and wages plus contributions to pensions, sick, and other social funds, amount to between 63 and 70 per cent, the percentage differing in different mines.

The iron ore market is active. The demand for native Siegerland ore has greatly increased, and prices are upward. The South Russian Ore Trust, reports the Moscow *Ekonomitcheskaya Zhizn*, has contracted to deliver to German firms 15,000,000 puds (242,000 gross tons) of iron ore in 1925 and 6,000,000 puds (97,000 gross tons) of manganese ore. The import of Swedish ore in 1925 will exceed, it is estimated, that of before the war, while imports from Spain are expected to decline. Contracts have been made so far for delivery of 400,000 to 500,000 tons of Wabana ore. The Essen *Bergwerks Zeitung* states that German consumption of this ore will not decline even if the expected agreement is made with France. French minette is at present not cheap; and shortage of labor probably would prevent France from supplying a large German demand, all the more so because the Italian laborers in Lorraine are being replaced with Polish and Moroccan laborers of much lower efficiency.

### Activity in Scrap and Pig Iron

The scrap market is firm. Best iron scrap is quoted at 76 gold marks per metric ton ($18.39 per net ton), steel scrap 78 marks ($18.88), steel turnings 67 marks ($16.21). The whole European market shows rising prices for scrap.

The pig iron market is active; there is a great demand from the foundries. Building activity has increased greatly and structural material is increasingly required. Shipbuilding material is not in demand. Some steel works refuse to deliver in less than eight weeks. The export market is still weak owing to heavy competition, but German producers have mostly enough to do for the home market. The Solingen steel export trade is depressed. Improvement is expected only in-so-far as the German negotiators for the pending commercial treaties succeed in obtaining most-favored-nation treatment. In England they did succeed; but Premier Baldwin's subsequent announcement of his industry-safeguarding program makes it doubtful whether the English market will really be open to German manufactured metal goods. The improvement in credit conditions has fostered the home selling of Solingen goods.

### Tool and Equipment Branches

Conditions in the railroad car construction branch have undergone no improvement. The State Railroad Department (now Railroad Corporation), which before the war gave about 70 per cent of all orders in this branch, has for months past given no orders at all; and its repair work is being increasingly done in its own shops. The tool and machine tool industries report considerable improvement in the home market, but the export market is dead. There is a big demand for twist drills. In this branch manufacturers are sharply competing in the matter of technical improvements. The Hagen, Remscheid, Velbert and Schmalkalden manufacturers of tools and small iron and steel wares all report increased activity, but prices are not satisfactory. Krupps have received a Russian order for 10,000 farm machines, to be delivered within two years.

Sheets are in great demand. The Siegerland works refuse to deliver thin sheets in less than four months; and they demand prices 15 per cent above those current in December.

Prices in the fourth week of December, in gold marks per metric ton and American equivalent, were:

| | |
|---|---|
| Blooms | 112 ($27.11 per gross ton) |
| Billets | 118 to 120 ($28.56 to $29.04) |
| Slabs | 123 to 125 ($29.65 to $30.25) |
| Bars | 130 (1.40c. per lb.) |
| Structural forms | 125 to 127 (1.35c. to 1.37c.) |
| Universal iron | 140 (1.51c.) |
| Bands | 160 (1.73c.) |
| Thick sheets (5 mm. or No. 6½ gage and over) | 150 (1.62c.) |
| Medium sheets (3 to 5 mm.) | 170 (1.84c.) |
| Thin sheets (1 to 3 mm. or No. 19½ to No. 12½ gage) | 220 (2.16c.) |
| Thin sheets (under 1 mm.) | 215 (2.32c.) |

In view of the improved market, it was expected that the new Raw Steel Syndicate would remove its all-around 20 per cent reduction of output; but for January the reduction has been retained. The question whether it shall be retained also for February was postponed after discussion at the last syndicate meeting. The syndicate reports that its work is proceeding satisfactorily. Negotiations are proceeding for a compromise between the iron producers and the manufacturing consumers. The opposition between the two groups lies not only in the fact that the manufacturers object to the producers' demand for a 50 per cent increase of import duties in the pending new tariff, but also that the manufacturers fear that their interests will be damaged by the agreement being negotiated between the producers and the French iron concerns.

The proposed syndicate for semi-finished materials has been formed and operates from Jan. 1. The syndicates for bars and structural forms are not yet formed, but an agreement in principle to form them has been reached, it being decided that the syndicates shall regulate and if necessary ration production and fix prices, but shall not act as selling organizations for the member concerns.

### No International Syndicate or Franco-German Concord

In the question of the International Steel Syndicate, or in the narrower form of a mere Franco-German steel agreement, no conclusion has yet been reached. The past weeks have brought many conflicting reports. It seems certain that no real international syndicate or trust has any chance of formation. Fritz Thyssen declares in the Vienna *Neue Freie Presse* that "an international steel trust is a phantom." He adds, however, that as the export prices obtained by Germany do not cover production cost, an "agreement" must be come to with other countries "to regulate the price-level." At the root of the price trouble is the fact that Alsace-Lorraine, which before the war had a good market in Germany, now throws its output on the world market, and spoils this market. England, added Herr Thyssen, does not stand to lose as result of a Franco-German agreement. He naturally backs the demand of the Steel Syndicate and of German producers generally for a higher tariff. "If we do not get protection, we shall become a mere selling domain for other countries."

According to the Essen organ of the smelting industry, the following was the offer made by Herr Thyssen in Paris in connection with the commercial treaty negotiations. The German iron producers would guarantee to take, for the whole term of the commercial treaty, a fixed quantity of French iron, paying whatever price the French are getting for their iron in Antwerp. The French iron would be taken over by German syndicates, so long as these exist, otherwise

it would be taken over by the eight chief Rhenish-Westphalian iron corporations. Negotiations concerning the quantity would be held from time to time—according to one statement the quantity mentioned was 1,000,000 tons. In exchange France would grant the benefits of her minimal tariff to German iron and steel manufactured goods. The eight German corporations are reported to be Gutehoffnung, Krupp, Phoenix, Rhenish Steel, Thyssen, Kloeckner, Hoesch and Rhine-Elbe Union (a Stinnes concern).

Representatives of the iron-consuming industries severely condemn this project, claiming that, in connection with the proposed 50 per cent increase of iron import duties, it will constitute a corporation monopoly in heavy iron and steel. Privy Councillor Kloeckner declares that manufacturers must form syndicates for iron and steel finished goods. He adds that there is no overproduction of iron and steel at present; there is merely under-consumption, the remedy for which is to reopen agricultural East Europe, a process which can succeed only if credits are given.

## WEAKENING FRENCH MARKET

### Sentiment Pessimistic in Iron and Steel Circles—Costs Hamper Development

PARIS, Dec. 27.—The market, at a standstill, shows a tendency to weaken. The sentiment is pessimistic as regards the future and the policy of the government is not likely to bring an improvement in the present situation. Hardly is the internal loan covered than there is talk of another; hardly has the French Bank raised its rate of discount than rumors of a further increase of from ½ to 1 point are circulating. There is a hard campaign against the cost of living and in spite of this the railroads are authorized to increase their freight rates by about 10 per cent; besides, we are still waiting for the conclusion of the Franco-German iron and steel negotiations. However, the last few days have been marked, in France and in Belgium, by a slight improvement.

**Coke.**—During the first 22 days of December the ORCA has been supplied with 241,093 tons (11,000 tons about daily average). The present rate is not yet sufficient to make up for November's deficiency, which it was arranged to fill in this month and next. Although the French government is losing 20 fr. per ton of coke sold to members of the ORCA at 143.75 fr. ($7.03 per net ton, at 5.39c. per franc), it has been resolved that this price will remain in force until further notice.

**Pig Iron.**—Firmness prevails. Trading is satisfactory, both at home and for export. Most of the furnaces are booked up to the middle of January. Foundry iron is rather scarce at 310 fr. ($16.97 per gross ton), average price. For export prices fluctuate from 340 to 350 fr. ($18.62 to $19.16), f.o.b. Dunkirk or Antwerp. C.i.f., Atlantic ports, phosphorus foundry iron (2.5 to 3 per cent Si. and 1.7 to 1.8 per cent Ph.) is offered at 410 to 420 fr. ($22.45 to $23); semi-phosphorus foundry iron (0.9 to 0.10 per cent Ph.) is offered at 430 to 440 fr. ($23.55 to $24.10), but materials are scarce. The market for basic is not very lively, as most of the steel works are keeping their production for themselves. The average price is 320 fr. per ton, ($17.52), f.o.b. Dunkirk. Transactions in hematite have recovered part of their activity with Italy, with the reopening of the frontier at Modane, closed for some time. The average inland rate is 400 to 420 fr. per ton ($21.90 to $23), at works, according to grade and origin.

**Ferroalloys.**—The market is steady, both as regards ferrosilicon and ferromanganese. The French ruling price is 1500 fr. per ton ($82.15) delivered (76 to 80 per cent Mn.), against the British price of £14 5s. ($67) for transactions with Belgium and Holland, and £14 10s. for transactions with Luxemburg (1245 French fr., or $68.20).

**Semi-Finished Products.**—Demand has much slackened, the market running short of supplies. Prices are firm. Inland quotations are as follows: Ingots, 39 to 40 fr. (per 100 kg.), or $21.36 to $21.90; blooms, 41 to 42 fr. ($22.45 to $23); billets, 43 to 44 fr. ($23.55 to $24.09); largets, 45 to 46 fr. ($24.64 to $25.20). For export, British and German buying has practically ceased. Prices are easier, as follows: Blooms, £4 18s. 6d. to £5 ($23.15 to $23.50); billets, £5 2s. 6d. to £5 5s. ($24.10 to $24.68); largets, £5 6s. to £5 7s. 6d. ($24.90 to $25.25). Certain plants which had been out of the market for some time are back again and taking orders.

**Rolled Steels.**—Calmness is the dominant feature of this section. Apart from replenishing stocks to meet the first requirements of the building season, there are no fresh orders in beams; prices are lower. Some rolling mills have a large supply of orders on hand in steel bars and will remain busy for at least six weeks to two months. They are, however, looking for new work. There is a tacit agreement between the producers to maintain the average price at the rate of 51 fr. (1.25c. per lb.); in the East prices vary from 51 to 53 fr. (1.25c. to 1.30c.); in the North, West and Center, from 51 to 56 fr. (1.25c. to 1.37c.). The export market is quiet, although the outlook in this section would be rather satisfactory, due to the revival of the American market. Current quotations for beams are £5 10s. to £5 12s. 6d. (1.15c. to 1.18c. per lb.); for bars, £5 15s. to £5 17s. 6d. (1.21c. to 1.24c.).

**Plates and Sheets.**—Good tendency, apart from the heavy gages. New orders are coming in regularly and prices of medium and light sheets are firm. The price of heavy sheets has fallen to 64 fr., or 1.56c. per lb. (5 mm. or No. 6½ gage and over); 80 fr., or 1.96c. for 2 mm. or No. 14 gage sheets, has been recorded in the department of the Ardennes. The market for light sheets remained quite active with sustained prices: the 1.57 mm., or No. 16½ gage, is worth 110 fr. (2.69c.) average. The State Railroads have bought from Longwy some 2 m. x 1 m. x 1 mm. (6 ft. 7 in. x 3 ft. 3 in. x No. 19½ gage) sheets at 130.80 fr. (3.20c.), delivered Rennes; 123.60 fr. (3.02c.) delivered Le Mans.

**Wire Products.**—Very little change in this section; derivatives are more resistant, nails especially; wire rod is rather unsteady at 56 to 58 fr. per 100 kg. ($30.66 to $31.76) at works; £6 5s. ($29.39), f.o.b. for export.

**Foundry.**—Great slackening of activity with the approach of the year end. Prices are consistently decreasing. The State Railroads have bought 300 small pulleys of 200 mm. (7⅞ in.) diameter, weighing 48 kg. (10.6 lb.) each, at 160 fr. per 100 kg. (3.91c. per lb.). Normal activity in steel foundry; 600 tons of cast steel buffer parts have been taken by two firms of the Ardennes and Aisne at 222 fr. per 100 kg. (5.43c. per lb.).

## Luxemburg Iron and Steel

LUXEMBURG, Dec. 24.—Blast furnaces active at the end of November included:

Arbed, all 6 at Esch; all 6 at Dudelange; 2 of the 3 at Dommeldange. Terres Rouges, all 6 at Belval; Esch closed. Hadir, 8 of the 10 at Differdange; Rumelange closed. Rodange, 4 of the 5. Steinfort, 2 of the 3. This makes a total of 34 furnaces blowing.

Production included: Basic pig iron, 179,877 tons; foundry iron, 5324 tons; forge iron, 15 tons; total, 185,216 tons. Basic steel, 156,212 tons; open-hearth steel, 1029 tons; electric steel, 557 tons; total, 157,798 tons.

## Steels for Automobiles

"Automotive Steels and Automobile Design" will be the topic of an address by Thomas H. Wickenden at the January meeting of the New York chapter of the American Society for Steel Treating on Wednesday evening, Jan. 21, in the assembly room of the Merchants' Association of New York, Woolworth Building. Mr. Wickenden is connected with the development and research department of the International Nickel Co., New York.

## New American Members of British Institute of Metals

The number of American members of the British Institute of Metals has been increased to 157 by the election recently of 20. These were selected in December and the next election is to take place on Feb. 25, full particulars of which can be obtained from the institute's American representative, W. M. Corse, National Research Council, Washington. The members recently elected are as follows:

William H. Bassett, Jr., technical supervisor American Brass Co., Ansonia, Conn.; John Henry Calbeck, director of research Eagle-Picher Lead Co., Joplin, Mo.; Prof. William Campbell, Ph.D., Sc.D., M.A., Howe professor of metallurgy, School of Mines, Columbia University, New York; Frederick S. Chase, president Chase Companies, Inc., Waterbury, Conn.; Howard H. Craver, manager chemical department Pittsburgh Testing Laboratory, Pittsburgh; Launcelot A. Danse, metallurgist Cadillac Motor Car Co., Detroit; Carl F. Dietz, president and general manager Bridgeport Brass Co., Bridgeport, Conn.; Edgar Hutton Dix, Jr., metallurgist research bureau Aluminum Co. of America, New Kensington, Pa.; James F. Donnelly, metallurgist A. Schrader's Son, Inc., Brooklyn; Hermann L. Greene, chief metallurgist Willys-Overland Co., Toledo, Ohio; William A. Hamor, assistant director Mellon Institute of Industrial Research, Pittsburgh; Charles R. Hook, vice-president and general manager American Rolling Mill Co., Middletown, Ohio; H. Kriegsheim, president Permutit Co., New York; Daniel H. Meloche, metallurgist Holley Carburetor Co., Detroit; Fritz N. Meyer, technical supervisor American Brass Co., Waterbury, Conn.; Harold H. Richardson, metallurgist Aluminum Co. of America, New Kensington, Pa.; Robert J. Shoemaker, metallurgical engineer Magnus Co., Inc., Chicago; Anthony J. Smith, assistant metallurgist Packard Motor Car Co., Detroit; Frank N. Speller, metallurgical engineer National Tube Co., Pittsburgh; Ewart S. Taylerson, metallurgical engineer American Sheet & Tinplate Co., Pittsburgh.

## Working for Lower Freight Rates

YOUNGSTOWN, Jan. 13.—Primary iron and steel interests in this district are devoting considerable attention to the problem of securing more equitable freight rates, especially on pipe and plates shipped to the Southwest. Traffic departments are cooperating with the traffic department of the Youngstown Chamber of Commerce, under direction of H. D. Rhodehouse, in the compilation of data for submission to the Interstate Commerce Commission.

Steel producers in Pittsburgh, Youngstown and Cleveland are collaborating in this movement. It is hoped to eliminate certain inequalities, which, it is claimed, militate against these districts, as compared, for instance, with producers at Chicago. It is the aim to establish rates which will improve the competitive position of makers in the three districts mentioned.

The problem of water transportation via the Ohio and Mississippi Rivers is also receiving consideration.

Steel companies believe that by combining efforts in their attempt to seek an adjustment of freight charges they will make considerable headway.

## Distribution Problems Being Considered at National Capital Conference

WASHINGTON, Jan. 13.—The growing importance of the question of the wide spread in price between producers and consumers has heightened interest in the conference to begin Wednesday by the Domestic Distribution Department of the Chamber of Commerce of the United States. It is the hope of the chamber that the meeting will lead to a nation-wide movement to lower distribution costs with a consequent saving to the hosts of consumers. The two days given over to the preliminary sessions will permit only a part discussion of the fundamentals. Details will fall to the lot of numerous representative communities.

The conferees will discuss the relationship of the consumer to the retail merchant, the manufacturer and wholesaler. One of the most important topics will be the proposed census of distribution.

The only formal address delivered today was made by Secretary of Commerce Herbert Hoover, who outlined from the national viewpoint the problems involved in distribution. The chamber estimated that the conference would be attended by approximately 150 delegates. Among the delegates listed to attend are the following: Charles F. Abbott, executive director American Institute of Steel Construction, New York; Gabriel S. Brown, president Alpha Portland Cement Co., Easton, Pa.; W. A. Carson, president American Washing Machine Manufacturing Association, Evansville, Ind.; Anson B. Gardner, Westinghouse Electric & Mfg. Co., New York.

## Contract for Stambaugh Memorial

YOUNGSTOWN, Jan. 12.—Hegeman-Harris, Inc., New York, has been retained as erecting engineer and contractor for the Stambaugh Memorial Auditorium to be built at a cost of $1,100,000. Construction will commence in the spring. The auditorium is the gift to the city of Henry H. Stambaugh, who during his lifetime was the leading interest in the Brier Hill Steel Co., now a part of the Youngstown Sheet & Tube Co. The building will be used principally for public assembly purposes, and will seat 2700. Helme & Corbett, New York architects, will supervise construction.

## Vice-President Purnell Appeals to Workers

In a current statement to employees of the Youngstown Sheet & Tube Co., Frank Purnell, executive vice-president in charge of sales, solicits the cooperation of the company's workers in further improving its products and in developing good-will.

"Every workman who has anything to do with the making of any material turned out by our mills is, to a certain extent, personally responsible for its quality. If he realizes this fully, and understands how important his work is for the general result, he will take a personal interest in it and feel pride in the excellence of the product which has passed through his hands. Good work is largely a matter of a spirit of this kind. It is not something that can always be secured by rules and regulations, inspection or anything else than the interest and pride of the workmen.

"I would like to see every man in our works realize how important it is that he have the spirit of the company. It is on this spirit of cooperation and mutual assistance in the production of high-grade materials, as well as on its policy of service and fair dealing with its customers, that the company has built its great business."

## New Records at Edgar Thomson Plant

The Edgar Thomson 16-furnace open-hearth plant, Carnegie Steel Co., Braddock, Pa., which during the last four years has established 96 plant production records, last week made five new plant records. They include a world's record of production on Jan. 8, for a plant of 16 open-hearth furnaces of the stationary type for a 24-hr. run, which passed the plant's best previous daily mark. The old daily record for the original 14-furnace unit was passed also. Earlier in the week, the department established a new and short-lived daily record by a small margin and during the week, two of the furnaces hung up new weekly records on tonnage. A feature of the daily record was that less than 3 per cent of the steel was outside the exacting specifications which govern open-hearth steel. Another feature was that the records were attained without injury to any of the men.

The annual dinner of the operating officials of the Carnegie Steel Co. was held at the Duquesne Club, Pittsburgh, Saturday evening, Jan. 10. James A. Farrell, president United States Steel Corporation, was chief guest. Out of respect to the memory of the late William Whigham and Charles E. McKillips, the entertainment which has been a feature of these gatherings for several years was omitted.

# Iron and Steel Markets

## OPERATIONS INCREASE

### Situation Hinges on Consumption in Secondary Lines

### Railroad Buying and Inquiry Keep Up—Automobile Makers Conservative

The first two weeks of the new year naturally have seen some lessening of the buying pace of November and December, which provided most consumers with steel for the first quarter and many mills with a large-scale operation for the same period.

It is early to look for second quarter buying of the heavier materials, seeing that producers expect to write their present asking prices into second quarter contracts, while consumers find in the present high rate of production an assurance that they will get ample supplies for all their requirements. The firmer tone which December developed in all finished steel markets, partly as the result of advances in raw materials, is still in evidence.

Meanwhile buyers and sellers are watching secondary markets for signs of increasing demand for the products of manufacturing consumers of steel, and the next few weeks are expected to give better indications in that respect.

At the same time the note is sounded that the continuance of the 1924 rate of new construction need not be expected if labor and material prices are advanced beyond present levels.

Though at a less rate of increase than that of December, blast furnace and steel works output has grown since the year opened. In the Chicago district both independent and Steel Corporation steel plants are running close to 95 per cent. For the entire country the rate is fully 85 per cent.

While the December gain of 23 blast furnaces may not be repeated in January, several resumptions are reported for the past 10 days, both of steel works and merchant furnaces, and more are scheduled for the next two weeks.

In addition to the expected Santa Fe order for 71,000 tons of rails and track accessories, to the Colorado mill, early action is looked for on the inquiries of the Burlington and Rock Island, each for 40,000 to 45,000 tons of rails. The Chicago & Alton has bought 8000 tons of rails at Chicago. The Chesapeake & Ohio is in the market for 30,000 tons and the Cotton Belt for 11,000 tons.

The New York Central is inquiring for 3000 box and 2000 gondola cars, the General Refrigerator Line for 1000 cars, the Canadian National for 500 and the Union Pacific for 1000. The Norfolk & Western has placed orders for the repair of 1538 cars.

Automobile companies are buying conservatively, taking less steel than at this time last year. One of the leading companies made a large purchase of bars this month, but the Ford Motor Co. has still to buy steel for the first quarter, sellers being unwilling thus far to meet its ideas of price.

Though the large bookings of fabricated steel work in November were due in part to low steel prices, which were expected to advance, contracts so far in January are only 25 per cent off from the November average and fully up to that of December. New inquiries call for a volume within 5 per cent of the weekly average of November and December.

Sheet mills keep up a high rate of production, most of them being close to an 85 per cent operation. Independent companies averaged 82 per cent in December and at that added about 100,000 tons to their unfilled orders.

That sheet manufacturers accepted business for shipment in November and December at the low average price of 3.40c., Pittsburgh, for black sheets is shown by the bi-monthly settlement, which causes a decline of 1.5 per cent in wages of mill workers for January and February.

An effort is being made to advance the price of seamless steel boiler tubes, which for some time have been conspicuously weak. A new card as of Jan. 1 would make some sizes nearly $15 a ton higher.

Moderate activity in pig iron at Pittsburgh caused the advance of prices of both steel making and foundry grades 50c. The Cleveland market shows some movement, but at Chicago the price advance has been checked and the market is dull, as it is in nearly all other centers. The extent of speculative buying on the late 1924 movement is still under discussion. Demand for second quarter delivery has not been active enough to test prices. It now appears that the increased cost of making pig iron due to the coke wage advance will not be so large as recently estimated.

France and Germany reached no agreement last week on the importation of surplus French steel into Germany. The Versailles treaty clause having lapsed on Jan. 10 there is now the grave possibility of a tariff war.

THE IRON AGE pig iron composite price is now $22.50, against $22.25 last week. This is the tenth successive weekly advance since the low point of $19.21 was established, the day before election.

Finished steel remains at 2.56c. per lb., THE IRON AGE composite price showing no change.

## Pittsburgh

### Specifications Not Coming So Freely—Pig Iron Quotations Advanced

PITTSBURGH, Jan. 13—The steel market has lost some of the bouyancy of tone that was its prevailing characteristic during the last two months of last year and any ideas which may have existed that the market was making toward a boom have disappeared. It may be that inventories are not yet completed or that as a result of taking out more than the usual amount of steel in December consumers found upon completion of stock-taking that they were rather well supplied, but the fact is that there has been some quieting down in specifications, this being notably the case in the lighter forms of finished material. There is the added factor

# A Comparison of Prices

**Advances Over the Previous Week in Heavy Type, Declines in Italics**

**At date, one week, one month, and one year previous**

## For Early Delivery

| Pig Iron, Per Gross Ton: | Jan. 13, 1925 | Jan. 6, 1925 | Dec. 16, 1924 | Jan. 15, 1924 |
|---|---|---|---|---|
| No. 2X, Philadelphia‡ | $25.01 | $25.01 | $24.51 | $24.26 |
| No. 2, Valley Furnace† | **22.50** | 22.00 | 21.00 | 22.50 |
| No. 2, Southern, Cin'ti† | 24.05 | 24.05 | 24.05 | 25.05 |
| No. 2, Birmingham, Ala.† | 20.00 | 20.00 | 20.00 | 21.00 |
| No. 2 foundry, Chicago* | 24.00 | 24.00 | 22.50 | 24.00 |
| Basic, del'd, eastern Pa. | 24.25 | 24.25 | 23.50 | 23.25 |
| Basic, Valley furnace | **22.00** | 21.50 | 21.00 | 21.00 |
| Valley Bessemer del. P'gh. | **24.76** | 24.26 | 23.76 | 24.76 |
| Malleable, Chicago* | 24.00 | 24.00 | 22.50 | 24.00 |
| Malleable, Valley | **22.50** | 22.00 | 21.00 | 22.50 |
| Gray forge, Pittsburgh | **23.76** | 23.26 | 22.26 | 23.76 |
| L. S. charcoal, Chicago | 29.04 | 29.04 | 29.04 | 29.15 |
| Ferromanganese, furnace | 110.00 | 110.00 | 105.00 | 109.00 |
| **Rails, Billets, Etc.,** Per Gross Ton: | | | | |
| O.-h. rails, heavy, at mill | $43.00 | $43.00 | $43.00 | $43.00 |
| Bess. billets, Pittsburgh | 37.00 | 37.00 | 36.00 | 40.00 |
| O.-h. billets, Pittsburgh | 38.00 | 38.00 | 36.00 | 40.00 |
| O.-h. sheet bars, P'gh. | 39.00 | 39.00 | 37.00 | 42.50 |
| Forging billets, base, P'gh. | 42.50 | 42.50 | 42.50 | 45.00 |
| O.-h. billets, Phila. | 41.67 | 41.67 | 41.67 | 45.17 |
| Wire rods, Pittsburgh | 48.00 | 48.00 | 48.00 | 51.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, gr. steel, P'gh, lb. | 2.00 | 2.00 | 2.00 | 2.35 |
| Light rails at mill | 1.80 | 1.80 | 1.80 | 2.25 |
| **Finished Iron and Steel,** | | | | |
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Iron bars, Philadelphia | **2.28** | 2.23 | 2.32 | 2.62 |
| Iron bars, Chicago | 2.00 | 2.00 | 2.00 | 2.40 |
| Steel bars, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.40 |
| Steel bars, Chicago | 2.10 | 2.10 | 2.10 | 2.50 |
| Steel bars, New York | 2.44 | 2.44 | 2.44 | 2.74 |
| Tank plates, Pittsburgh | 2.00 | 2.00 | 1.90 | 2.50 |
| Tank plates, Chicago | 2.20 | 2.20 | 2.20 | 2.60 |
| Tank plates, New York | 2.34 | 2.34 | 2.24 | 2.74 |
| Beams, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.50 |
| Beams, Chicago | 2.20 | 2.20 | 2.20 | 2.60 |
| Beams, New York | 2.34 | 2.34 | 2.34 | 2.74 |
| Steel hoops, Pittsburgh | 2.50 | 2.50 | 2.50 | 3.00 |

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

| Sheets, Nails and Wire, | Jan. 13, 1925 | Jan. 6, 1925 | Dec. 16, 1924 | Jan. 15, 1924 |
|---|---|---|---|---|
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Sheets, black, No. 28, P'gh. | 3.60 | 3.60 | 3.50 | 3.85 |
| Sheets, black, No. 28, Chicago dist. mill | 3.70 | 3.70 | 3.70 | ... |
| Sheets, galv., No. 28, P'gh. | 4.75 | 4.75 | 4.75 | 5.00 |
| Sheets, galv., No. 28, Chicago dist. mill | 4.85 | 4.85 | 4.85 | ... |
| Sheets, blue, 9 & 10, P'gh | 2.70 | 2.70 | 2.70 | 3.00 |
| Sheets, blue, 9 & 10, Chicago dist. mill | 2.80 | 2.80 | 2.80 | ... |
| Wire nails, Pittsburgh | 2.85 | 2.85 | 2.85 | 3.00 |
| Wire nails, Chicago dist. mill | 2.95 | 2.95 | 2.95 | ... |
| Plain wire, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.75 |
| Plain wire, Chicago dist. mill | 2.70 | 2.70 | 2.70 | ... |
| Barbed wire, galv., P'gh. | 3.55 | 3.55 | 3.55 | 3.80 |
| Barbed wire, galv., Chicago dist. mill | 3.65 | 3.65 | 3.65 | ... |
| Tin plate, 100 lb. box, P'gh. | $5.50 | $5.50 | $5.50 | $5.50 |
| **Old Material,** Per Gross Ton: | | | | |
| Carwheels, Chicago | **$22.50** | $22.00 | $20.00 | $20.50 |
| Carwheels, Philadelphia | 19.50 | 19.50 | 19.00 | 20.00 |
| Heavy steel scrap, P'gh. | 22.00 | 22.00 | 21.50 | 21.50 |
| Heavy steel scrap, Phila. | 20.00 | 20.00 | 20.00 | 18.00 |
| Heavy steel scrap, Ch'go. | **20.50** | 19.75 | 18.75 | 17.00 |
| No. 1 cast, Pittsburgh | 19.50 | 19.50 | 19.00 | 21.00 |
| No. 1 cast, Philadelphia | 20.50 | 20.50 | 19.50 | 20.50 |
| No. 1 cast, Ch'go (net ton) | 20.50 | 20.50 | 19.00 | 20.50 |
| No. 1 RR. wrot. Phila. | 21.00 | 21.00 | 21.00 | 21.50 |
| No.1 RR wrot.Chicago (net) | **18.00** | 17.75 | 16.50 | 15.00 |
| **Coke, Connellsville,** | | | | |
| Per Net Ton at Oven: | | | | |
| Furnace coke, prompt | **$4.00** | $4.15 | $3.75 | $4.00 |
| Foundry coke, prompt | 5.00 | 5.00 | 4.50 | 4.75 |
| **Metals,** | | | | |
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Lake copper, New York | 15.25 | 15.25 | 14.50 | 12.75 |
| Electrolytic copper, refinery | 14.87½ | 14.87½ | 14.25 | 12.25 |
| Zinc, St. Louis | **7.87½** | 7.85 | 7.55 | 6.35 |
| Zinc, New York | **8.22½** | 8.20 | 7.90 | 6.70 |
| Lead, St. Louis | **10.35** | 10.00 | 9.37½ | 8.00 |
| Lead, New York | **10.60** | 10.25 | 9.62½ | 8.25 |
| Tin (Straits), New York | *59.80* | 59.87½ | 55.87½ | 49.50 |
| Antimony (Asiatic), N. Y. | *17.50* | 18.00 | 14.00 | 10.00 |

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

## THE IRON AGE Composite Prices

**Jan. 13, 1925, Finished Steel, 2.560c. Per Lb.**

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

| | |
|---|---|
| Jan. 6, 1925, | 2.560c. |
| Dec. 16, 1924, | 2.531c. |
| Jan. 15, 1924, | 2.789c. |
| 10-year pre-war average, | 1.689c. |

**Jan. 13, 1925, Pig Iron, $22.50 Per Gross Ton**

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

| | |
|---|---|
| Jan. 6, 1925, | $22.25 |
| Dec. 16, 1924, | 21.67 |
| Jan. 15, 1924, | 22.04 |
| 10-year pre-war average, | 15.72 |

| 1924 High | 1924 Low | | 1923 High | 1923 Low |
|---|---|---|---|---|
| 2.789c., Jan. 15 | 2.460c., Oct. 14 | Finished Steel | 2.824c., April 24 | 2.446c., Jan. 2 |
| $22.88, Feb. 26 | $19.21, Nov. 3 | Pig Iron | $30.86, March 20 | $20.77, Nov. 20 |

in creating a calmer feeling in the fact that raw materials were advancing a little too rapidly for safety in the opinion of many of the trade and the rapidity with which iron and steel production has increased since the election has no doubt impressed buyers that there is little danger that they will be unable to get ample supplies to meet all requirements.

The fact that business now on the books of the steel makers taken at prices well below today's levels, in conjunction with the fact that the secondary consumption has not yet increased appreciably, no doubt encourages buyers to defer specifications in the hope that they can carry over some low priced steel into the second quarter. At the same time, there has been no material slowing down in the production of steel because all manufacturers are well provided with specifications for January shipments. There is, however, less tendency to increase production than was the case a short time ago.

A few sizable purchases of basic iron have lifted the price of that grade 50c. a ton and there has been a like advance in other grades of pig iron based on a few fair sized transactions. The pig iron market is not very active and interest in second quarter tonnages is not pronounced. It develops that the increase in contract coke prices as a result of the change in the wage scale by independent Connellsville producers is not so great as was at first expected; some contracts carry an in-

crease over the original price of only 65 or 75 cents a ton, as against $1 or more, the estimate of a few weeks ago.

The spot furnace coke market has weakened under offerings by producers who started idle capacity without having regular consuming connections, with sales noted as low as $4 and none over $4.25.

Another week has gone by without important price changes in finished steel, but the undertone of the market is firm and manufacturers believe that plates, shapes and bars and wire products still are too low. An effort is being made to advance prices of seamless steel boiler tubes, a new card of list prices having been issued by some of the independent producers under date of Jan. 1, which would add about $15 a ton to the prices of some sizes.

There is a dearth of offerings of semi-finished steel and non-integrated manufacturers who need additional tonnages have found it rather difficult to secure them. The fact that semi-finished steel is so scarce encourages merchant pig iron producers to believe that the steel companies will not be factors for a while at least in the pig iron market. Some steel company pig iron, however, has figured in recent transactions.

The scrap market, after showing a softer tendency over much of the week, has been stiffened slightly by the appearance in the market of two Pittsburgh district steel companies which have bought heavy melting steel at $22 and $22.50.

**Ferroalloys.**—Prices of ferrosilicon of the higher silicon contents have been advanced $2.50 a ton, to $85, delivered east of the Mississippi River, for 50 per cent and to $147.50 for 75 per cent. Early reports had it that users of 50 per cent material had pretty generally covered for a part if not all of their 1925 requirements, but it is now said that several regarded the price of $82.50, announced late last year on 1925 contracts, as too high and did not sign up. No sales yet are noted at the new prices. Consumers are specifying rather well against contract purchases of ferromanganese and spiegeleisen made at much below today's prices and there is very little new business. British producers today announced an advance of $5 per ton in ferromanganese to $115 c.i.f. Atlantic seaboard, and leading domestic producers also have gone to that price at furnace with freight equalized from seaboard. Prices are given on page 249.

**Pig Iron.**—In point of total turnover, the week has been a rather good one in this market. A Valley steel maker bought 10,000 tons of basic iron for delivery in February, March and April and paid $22, Valley furnace, for it. An eastern Ohio steel company paid the same Valley furnace base price on 10,000 tons for delivery starting next month and running into the second quarter, but it is said that none of this iron will be shipped from Valley furnaces. There has been a report that another Ohio steel company bought 30,000 tons of basic iron and paid $23, Valley furnace basis, for it, but there is no confirmation, and locally there is some inclination to doubt that the sale was made at that price unless it was part of a trade deal in which some finished steel figured. A large steel foundry interest has put out an inquiry for 3000 to 5000 tons of basic for delivery starting in February and extending into the second quarter for shipment to Alliance, Ohio. Quotations against this inquiry by Valley furnaces have been from $22.50 to $23. Small sales of basic iron have been made from a Pittsburgh district steel company furnace at $23. We note a sale of 3000 tons of Bessemer iron for shipment to a point east of Pittsburgh carrying a rate of $2.02 from the Valley at $23, Valley furnace. A smaller lot of the same grade of iron for shipment into northeastern Pennsylvania has been made at $23.50, Valley furnace. Two sales of malleable iron are noted from a western Pennsylvania furnace at $23 and $23.50, but to destinations where the freight is much less than that from Valley furnace, Valley iron of this grade can be bought at $22.50 to $23. Foundry iron also has advanced 50c. a ton since a week ago, with sales noted from $22.50 to $23. On second quarter tonnages of foundry iron few producers are interested in business at less than $23. None of the big users of this grade is showing very keen interest in second quarter tonnages, probably because they are pretty heavily covered for the present quarter and so far this year the melt has been light except in the cases of a few plants working on special business. Merchant producers do not seem anxious to sell at the moment, as they would like to get a clear line on ore and coke prices and they also figure that if the demand for steel holds up they may be able to get higher prices by reason of the fact that they will not be subject to steel company competition.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

| | |
|---|---|
| Basic | $22.00 to $22.50 |
| Bessemer | 23.00 to 23.50 |
| Gray forge | 22.00 to 22.50 |
| No. 2 foundry | 22.50 to 23.00 |
| No. 3 foundry | 22.00 to 22.50 |
| Malleable | 22.50 to 23.00 |
| Low phosphorus, copper free | 29.00 |

**Semi-Finished Steel.**—The price situation is very firm, although open market activity is not pronounced. Most nonintegrated steel manufacturers are pretty well covered by contracts for this quarter and so far have not suffered for want of supplies, except in a few cases, where finished steel orders were somewhat in excess of expectations and necessitated additional purchases of semi-finished steel. Practically producers of billets, slabs and sheet bars have finishing capacity of their own and being well supplied with first quarter finished steel business, naturally have less steel for open market sale than would be the case with lighter order books. Since there is a profit in the final operation, manufacturers are not disposed to bring the steel down to the last operation and then sell it. These are the reasons for the strength of the market rather than the size of current demands. Other forms of semi-finished steel are holding at recent levels. Steel production in this and nearby districts is not being pushed as much as recently, because specifications against finished steel contracts have suffered somewhat from the fact that inventories either have not been completed, or, if completed, have disclosed stocks of sufficient size to make buyers a little diffident about ordering out more material at this time. Prices are given on page 249.

**Wire Products.**—In a general way specifications for January shipment are coming along well under the stimulus of the fact that buyers who fail to specify by the expiration of their contracts stand to lose the advantage of the lower prices at which the contracts were written, either through cancellation of the unspecified tonnages or the extension of the contract on the basis of today's prices, which are $2 a ton over those at which existing contracts were priced. There are some cases where buyers have found themselves with rather large stocks and have consequently been disposed to withhold specifications, but generally the price advantage is sufficient to keep specifications coming along and mills in this district still are running at a high rate. Some makers have enough "live" business to insure practically full operations through February. The secondary market still is irregular, notably on nails, which still are selling from jobbers' stocks at much less than the usual differential over the mill prices. This suggests that consumptive requirements are not yet up to the producing rate. Meanwhile, mill prices are holding and there are suggestions of another advance, this time of $3 per ton. Prices are given on page 248.

**Rails and Track Supplies.**—Conditions show little change locally. Higher prices are wanted on light rails, but there is not enough demand to sustain an advance at this time. Demand for track supplies is steady rather than active and in point of business, specifications against old contracts at lower prices constitute a larger part than sales at today's quotations. Prices are given on page 248.

**Tubular Goods.**—Jobbers are specifying freely in merchant pipe of the sizes going into building and construction work, but lapwelded pipe still is rather slow

and probably will be until there is an improved situation in the oil industry. Not much line pipe business is coming out at present; the roads to the oil fields are so poor during the early part of each year that getting the pipe to the fields is not only difficult, but expensive. There is a rather high rate of pipe mill operation in view of the fact that present demands do not constitute a real tax upon capacity; the explanation is found in the fact that manufacturers are building up stocks to some extent against future demands. The boiler tube market is fairly active, but there is not sufficient business to give all makers a share and prices are not greatly stronger than they have been for some time. Some of the independent makers of seamless steel tubes, however, have issued new list prices which are substantially higher than the old ones. Seamless tubes, like pipe, are nominally listed at 10c. per lb., but, unlike pipe, tubes cannot run 5 per cent light; indeed, they have been running about 15 per cent overweight and that fact is recognized in the new lists. Thus 1-in. cold-drawn commercial tubes, which at 55 per cent off list under the old list would have sold at $90 a net ton, are figured at $105 a ton in the new list. Discounts are given on page 248.

**Cold-Finished Steel Bars and Shafting.**—Business in this line is good, but it could be better, and probably will be, as the automobile industry has not yet been a very heavy buyer and jobbers have not all completed their inventories and are not free about specifications at present. The price reductions in automobiles are looked to stimulate sales and to bring the manufacturers in for large steel tonnages in the next 30 to 60 days, as they have been close buyers for some time and are not believed to have very large stocks. Prices are firm and unchanged on screw stock and shafting. They are given on page 248.

**Hot-Rolled Flats.**—Makers generally are better supplied with business than before in almost a year and while there has been something of a lull in specifications over the past week or 10 days, this is regarded as part of the inventory period and is not disturbing. Certainly there is much less selling pressure than there was recently and greater firmness to prices than was true a few weeks ago. Prices are given on page 248.

**Sheets.**—Specifications on contracts are not so heavy as they have been, but this is believed to be due to the fact that inventories have not been completed or because secondary consumption has not increased materially. Most mills, however, have an ample supply of "live" business to maintain a high rate of production. The American Sheet & Tin Plate Co. is operating more than 85 per cent of its mills and it is believed that the sheet industry as a whole is running at about the same rate. Independent companies in December operated at about 82 per cent of capacity and new business ran sufficiently ahead of shipments to add about 100,000 tons to the unfilled orders.

**Tin Plate.**—Shipments are good for the time of year, but this does not mean that they are really heavy, because the real consumption of tin plate does not begin until along in May and June and much of the tin plate now leaving the mills is to safeguard the container manufacturers against future demand. This branch of the industry is probably averaging about 75 per cent of capacity operations. Mills are well sold up against production over the first six months of the year and the price also is well established for that period at $5.50 per base box, Pittsburgh.

**Iron and Steel Bars.**—Sales of small tonnages of steel bars are fairly numerous in this district and makers are having no trouble in obtaining the full price on such business. Specifications against old and lower priced orders are good and the mills still are running at a high rate. Iron bars are firm at recent prices with a good general demand. Prices are given on page 248.

**Structural Material.**—The market here is holding very firmly at the recent price, but it applies only on small tonnages as fabricators generally are protected against their larger requirements at lower prices. The report about fabricated steel is that price competition still is pretty sharp. Plain material prices are given on page 248.

**Plates.**—Firmness in prices of this product is ascribable more to the fact that the mills in this district are well filled up with business in other products which are more profitable than plates and are not anxious for plate business, rather than because there is a big demand.

**Cold-Rolled Strips.**—The makers in this district are making a firmer stand at 4.15c., base, and some claim that fully 75 per cent of the contracts for this period carry that price. A good deal of business, however, was taken at 4c., base, presumably for December specification, but which has become a first quarter obligation. On very large and attractive tonnages some mills still are going as low as 4c., Pittsburgh, or its equivalent.

**Bolts, Nuts and Rivets.**—Makers of bolts and nuts in this district had pretty heavy specifications late in December against fourth quarter contract. Shipments appear to be supplying the present requirements of buyers and there is not yet much specifying against first quarter contracts. Prices are holding well. The rivet market also is firm and fairly active. Prices of washers range from 6c. down to 5.50c. off list, and some makers are quoting as high as 5.10c. off list. Prices and discounts given on page 249.

**Coke and Coal.**—The spot furnace coke market has weakened since a week ago under the pressure of offerings by producers who started idle ovens without contracts for the output, but there is still a good deal of firmness of prices on second quarter contracts. There is much hesitancy among pig iron producers in signing second quarter contracts at $5.50, as it is pointed out that the wage scale in the Connellsville district is the same now as it was a year ago when second quarter contracts were written—$4 to $4.25. The spot foundry coke market holds at $5 to $6, but the higher figure is becoming somewhat exceptional. There is no particular change in the coal market. Prices are given on page 249.

**Old Material.**—Appearance in the market of a Pittsburgh district steel maker for a tonnage of steel works grades has tended to arrest, at least temporarily, a softer tendency in prices, which was developing as a result of a light consumptive demand and increased anxiety on the part of dealers for business. This interest picked up two or three lots of heavy steel scrap at $22. A steel company in the district with rather exacting specifications has paid $22.50 for a round lot of heavy melting steel. Dealers see much significance, as bearing on future steel works operations and demands for scrap, in the unfilled tonnage statement of the Steel Corporation, overlooking, apparently, that the statement does not distinguish between specified and unspecified business. The market plainly is weaker on the lighter forms of scrap, but remains firm on steel foundry grades. High prices were paid on the Pennsylvania Railroad January list, awards against which were made late last week. Heavy steel scrap sold close to $23 per gross ton for Steubenville, Massillon and Youngstown, Ohio, delivery, while as much as $24.50, Pittsburgh, was paid for the specialties.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

| | *Per Gross Ton* | |
|---|---|---|
| Heavy melting steel | $22.00 to | $22.50 |
| No. 1 cast, cupola size | 19.50 to | 20.00 |
| Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa. | 22.00 to | 23.00 |
| Compressed sheet steel | 20.00 to | 20.50 |
| Bundled sheets, sides and ends | 19.00 to | 19.50 |
| Railroad knuckles and couplers | 23.50 to | 24.00 |
| Railroad coil and leaf springs | 23.50 to | 24.00 |
| Low phosphorus blooms and billet ends | 26.50 to | 27.00 |
| Low phosphorus plate and other material | 25.00 to | 26.00 |
| Railroad malleable | 21.00 to | 21.50 |
| Steel car axles | 23.50 to | 24.00 |
| Cast iron wheels | 21.00 to | 21.50 |
| Rolled steel wheels | 23.50 to | 24.00 |
| Machine shop turnings | 17.50 to | 18.00 |
| Short shoveling turnings | 17.50 to | 18.00 |
| Sheet bar crops | 24.00 to | 25.00 |
| Heavy steel axle turnings | 19.00 to | 19.50 |
| Short mixed borings and turnings | 15.50 to | 16.00 |
| Heavy breakable cast | 19.00 to | 19.50 |
| Stove plate | 17.00 to | 17.50 |
| Cast iron borings | 17.50 to | 18.00 |
| No. 1 railroad wrought | 18.00 to | 18.50 |
| No. 2 railroad wrought | | 22.00 |

# Chicago

## Uncertainty as to Price Advances on Steel Products—Very Heavy Production

CHICAGO, Jan. 13.—Steel output in this district is now practically at capacity with the leading interest and the foremost independent both operating at 95 per cent. Steel works blast furnace production has also been increased through the blowing in of a tenth stack at South Chicago, making 30 active furnaces out of 34 in this district. A twelfth Gary furnace or a third Joliet stack may be put in during the week; possibly both will go in. At Duluth, where the two furnaces of the Minnesota Steel Co. have been idle for many months, one stack is scheduled to blow in within a week or two. Merchant pig iron output is also expanding. A second Federal stack went in last week and a third Iroquois furnace resumed this week, so that there are now seven strictly merchant units active, including one Mayville furnace and the Zenith stack at Duluth. Two smaller Iroquois stacks remain idle and there is apparently no early prospect of their going in, inasmuch as they are obsolescent and require rather extensive repairs. On the other hand, the inactive stack at Mayville is thoroughly modern, although there are no present plans for lighting it. Some consideration has been given to blowing in one of the two merchant stacks at the Bayview, Milwaukee, plant of the Illinois Steel Co., but no decision has been reached. Another merchant stack which has been idle for more than a year is the Thomas furnace at Milwaukee.

Chicago mills rolling the heavier products are in a very favorable position and reports are current that prices on plates, shapes and bars will advance $2 to $3 a ton. There is no intimation, however, as to just when the advances will materialize. Among car builders and railroads, higher prices are looked upon with disfavor. In this connection it is pointed out that recent car business was driven in by low bidding and that advances in steel would tend to discourage the carriers from placing further orders. The viewpoint of the mills, however, is that general market conditions are steadily strengthening the price situation and that moderate advances should not be cause for alarm when it is borne in mind that plates, shapes and bars are $8 a ton below what they were a year ago, at a time when car buying was also active.

In view of the uninterrupted improvement of the steel market since the Presidential election, it is not surprising that many observers are now pausing to consider whether the present situation will continue through the first half or will prove to be of relatively short duration, like the period of activity one year ago. In some quarters the view is voiced that there has been no increase in buying by the ultimate consumer comparable with the recent accelerated purchases by jobbers and manufacturers. Observers closely associated with the building industry are doubtful whether construction work will continue at the 1924 rate if prices of materials rise above present levels. A straw which may indicate the trend is the fact that production by sanitary ware manufacturers has declined. On the other hand, steel fabricating awards for the week are most encouraging and much new work is coming up for bids. For the Hibbard, Spencer, Bartlett & Co. warehouse, Chicago, 10,000 tons has been awarded to the American Bridge Co. A considerable tonnage in reinforcing steel, also required for this project, has not yet been figured on. Financing has finally been arranged for the large produce market center of the South Water Street Removal Co., Chicago, but it is now likely that the project will be constructed entirely according to reinforced concrete design.

**Pig Iron.**—Buying has slowed down materially and prices are unchanged. Some sales have been made for second quarter shipment, but it is evident that no real buying movement for that period has yet developed. In the meantime producers are heavily sold for first quarter and are not particularly anxious for further second quarter business until more definite information is available regarding probable increases in costs. Present ore stocks will probably not last until the middle of the second quarter, and ore prices are almost certain to advance. Fuel costs are also rising. The view is still held that much of the recent buying of iron was speculative, that melters bought to protect themselves against advances, without actually having orders for a commensurate tonnage of castings on their books. If this opinion has any basis in fact, it is hard to explain the insistent pressure for deliveries from furnaces. Shipments of merchant iron are running ahead of those for December; indeed there is every prospect that deliveries in January will be very close to, if they do not equal, those of the heaviest month on record. There continue to be occasional sales of iron from outside producing points in this territory. Soo iron of special analysis has been sold at prices equivalent to $24.50, base Chicago furnace. An Indiana melter has closed for 150 tons of Lake Erie foundry in higher silicon analysis at a price $1 under prevailing quotations from Chicago. A few carlots of Southern foundry have been sold at $20, base Birmingham. Current inquiries include 1000 tons of foundry for second quarter, and 500 tons of low phosphorus for January and February shipment. Low phosphorus is stronger as indicated by sales of 1000 tons and 300 tons at $29.50, Valley, the equivalent of $34.29 delivered, Chicago. Charcoal is unchanged notwithstanding better buying. Recent sales of charcoal in Michigan include 300 tons for first quarter and 1000 tons for second quarter. An Indiana melter has closed for 150 tons of silvery.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

| | |
|---|---|
| Northern No. 2 foundry, sil. 1.75 to 2.25 | $24.00 to $24.50 |
| Northern No. 1 foundry, sil. 2.25 to 2.75 | 25.00 to 25.50 |
| Malleable not over 2.25 sil. | 24.00 to 24.50 |
| Basic | 24.00 to 24.50 |
| High phosphorus | 24.00 to 24.50 |
| Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago | 29.04 |
| Southern No. 2 (barge and rail) | 25.18 |
| Southern No. 2, sil. 1.75 to 2.25 | 26.01 to 27.01 |
| Low phos., sil. 1 to 2 per cent, copper free | 34.29 |
| Silvery, sil. 8 per cent | 35.29 |
| Electric ferrosilicon, 14 to 16 per cent | 45.75 |

**Ferroalloys.**—Foreign producers of ferromanganganese have advanced prices to $115, seaboard. No action on the part of domestic makers has yet been reported. Spiegeleisen is firm at $33, Eastern furnace, with sales confined to a few carloads.

We quote 80 per cent ferromanganese, $117.56, delivered; 50 per cent ferrosilicon for 1925 delivery, $85.00, delivered; spiegeleisen, 18 to 22 per cent, $41.58, delivered.

**Plates.**—Railroad car builders remain the principal source of tonnage in plates. The expected revival in oil storage tank purchases has not yet materialized, but local mills have booked 1500 tons of plates from tank builders during the week. The city of St. Louis takes bids today on a water supply pipe line requiring 15,000 tons of plates. It is believed that the work will be placed with an Eastern fabricator.

The mill quotation is 2.20c., Chicago. Jobbers quote 3.10c. for plates out of stock.

**Sheets.**—Local capacity is well sold for first quarter and books for the next quarter are not expected to be opened until the middle of February, when advances will no doubt be announced.

Chicago delivered prices from mill are 3.75c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.90c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

**Bars.**—The tensest situation in the finished steel

market is in soft steel bars, specifications for which have been very heavy. Demand is coming from practically all sources and business from the automotive industry, which has been restricted, is now steadily expanding. Implement manufacturers are still conservative, although slowly increasing their specifications. The expected removal of the International Harvester Co.'s forge shop from Akron, Ohio, to Fort Wayne, Ind., or Chicago, will bring 6000 to 8000 tons of forging steel annually to local mills.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 2c. to 2.10c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

**Rails and Track Supplies.**—The Chicago & Alton has placed 8000 tons of rails with the Illinois Steel Co. The same mill has booked 6000 tons of tie plates for the New York Central and 2200 tons of tie plates, 20,000 kegs of spikes and 15,000 kegs of bolts for the Burlington. The Burlington and the Rock Island, which are expected to order 40,000 to 45,000 tons of rails each, have not yet taken action on their inquiries. The Chesapeake & Ohio is in the market for 30,000 tons, of which 15,000 tons will be placed in the East, while the Cotton Belt is about to close for 11,000 tons. Light rails are quiet.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. makers' mill.

Standard railroad spikes, 2.90c. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

**Cast Iron Pipe.**—If recommendations are followed, the 5250 tons of 6- to 12-in. on which Detroit took bids Dec. 29, will be divided between James B. Clow & Sons and the United States Cast Iron Pipe & Foundry Co. Menasha, Wis., has awarded 250 tons of centrifugal pipe to the National Cast Iron Pipe Co. Chicago takes bids Jan. 21 on 1263 tons of 6-, 8- and 12-in. Milwaukee receives tenders Jan. 19 on 3060 tons of 54-in. straight pipe, 22 tons of lugged pipe and 33 tons of special castings. Appleton, Wis., takes figures Jan. 16 on 250 tons of 4- to 12-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $52.20 to $54.20; 6-in. and over, $48.20 to $50.20; Class A and gas pipe, $4 extra.

**Bolts, Nuts and Rivets.**—Specifications against first quarter contracts for bolts and nuts still lag, although heavier than a week ago. The Ford Motor Co., which does not contract, but buys from month to month, is expected to close for a large quantity of nuts this week. The Hudson Motor Co. has placed large orders for nuts, bolts and rivets. On the whole, however, the automobile industry is conservative and is not taking the quantities it did last year at this time.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to ⅞ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to ⅞ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squared, tapped or blank, $3.50 off; hot pressed nuts, hexagon, tapped or blank, $4 off; coach or lag screws, 60 per cent off.

**Structural Material.**—Fabricating awards for the week total nearly 15,000 tons, while fresh prospects, including a 15,000-ton pipe line for St. Louis, aggregate 22,900 tons. The largest individual letting was the Hibbard, Spencer, Bartlett & Co. warehouse, Chicago, 10,000 tons, awarded to the American Bridge Co. The Tower Theater building, Chicago, 1500 tons, was placed with A. Bolter's Sons Co.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

**Reinforcing Bars.**—The market is gradually growing more active and this tendency is expected to become more pronounced as mill prices become stronger. An advance in mill quotations, of course, would be promptly reflected in higher warehouse prices. The national road show held in this city last week focused attention on highway work. In addition to the $100,000,000 program inaugurated in Illinois, $60,000,000 in bonds for a three-year program was authorized in the November election in Missouri, and a three-year $40,000,000 program has been proposed in Nebraska. Arkansas is also preparing to undertake highway construction on a large scale. Among building projects, the most attractive prospect is a warehouse for Sears, Roebuck & Co., at Kansas City, Mo., which will require 3700 tons. Sections A and B of the municipal sewer, St. Paul, Minn., 1700 tons, have not yet been placed.

Lettings include:

Polk County, Iowa, highway work, 250 tons to Laclede Steel Co.

Pasel high school, Kansas City, Mo., 325 tons, to Concrete Steel Co.

Muskegon, Mich., high school, 200 tons, to Concrete Engineering Co.

St. Luke's Hospital, Cedar Rapids, Iowa, 100 tons, to Concrete Engineering Co.

Missouri State road work, 100 tons, to Olney J. Dean & Co.

Pending work includes:

Sears Roebuck & Co., warehouse, Kansas City, Mo., 3700 tons, plans being drawn by George C. Nimmons & Co., architects, Chicago.

City of Chicago, Board of Local Improvements, South Water Street double decking, Sub-structures Sections 10, 11 and 12, 200 tons; super-structure Section 12, 1000 tons, bids to be taken Jan. 14.

Filtration and water softening plant, Springfield, Ill., 600 tons, general contract awarded to Cope & Fisher, Decatur, Ill.

Lilly Warehouse & Storage Co., building, Indianapolis, 700 tons, E. F. Daggett, architect, Indianapolis.

West Bend high school, West Bend, Wis., 100 tons, general contract awarded to the West Bend Construction Co.

**Fluorspar.**—Recent sales of 85 per cent material at $18, mines, reflect a decline of $2 a ton. A sale of 1000 tons of ground spar was closed at $32.50, mines.

**Wire Products.**—Buying still lacks impetus, but heavier specifications are expected to follow the completion of inventory taking by the jobbers. For mill prices see page 248.

**Old Material.**—An independent mill has closed for 5000 tons of heavy melting at $20.75 delivered, an advance of 75c. a ton over its most recent previous purchase. A large melter has bought railroad malleable at $21.50 and $22 delivered, but the same grade has been sold by a railroad at $22.42 delivered, indicating the confidence of dealers in the continued upward movement of the market; in fact, practically all brokers are active in buying material at advancing quotations, and there is apparently no fear of an early reaction. Most grades of scrap quoted below are 50c. to $1 a ton higher.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

| | *Per Gross Ton* | |
|---|---|---|
| Iron rails | $21.50 to | $22.00 |
| Cast iron car wheels | 22.50 to | 23.00 |
| Relaying rails, 56 and 60 lb. | 26.00 to | 27.00 |
| Relaying rails, 65 lb. and heavier | 27.00 to | 32.00 |
| Forged steel car wheels | 24.00 to | 24.50 |
| Railroad tires, charging box size | 24.50 to | 25.00 |
| Railroad leaf springs, cut apart | 24.00 to | 24.50 |
| Rails for rolling | 22.50 to | 23.00 |
| Steel rails, less than 3 ft. | 22.50 to | 23.00 |
| Heavy melting steel | 20.50 to | 21.00 |
| Frogs, switches and guards cut apart | 21.25 to | 21.75 |
| Shoveling steel | 20.25 to | 20.75 |
| Drop forge flashings | 15.75 to | 16.25 |
| Hydraulic compressed sheets | 17.50 to | 18.00 |
| Axle turnings | 18.50 to | 19.00 |
| Steel angle bars | 21.50 to | 22.00 |
| Steel knuckles and couplers | 23.50 to | 24.00 |
| Coil springs | 25.00 to | 25.50 |
| Low phos. punchings | 22.00 to | 22.50 |
| Machine shop turnings | 14.00 to | 14.50 |
| Cast borings | 16.25 to | 16.75 |
| Short shoveling turnings | 16.25 to | 16.75 |
| Railroad malleable | 22.00 to | 22.50 |
| Agricultural malleable | 21.00 to | 21.50 |
| | *Per Net Ton* | |
| Iron angle and splice bars | 22.50 to | 23.00 |
| Iron arch bars and transoms | 23.00 to | 23.50 |
| Iron car axles | 28.50 to | 29.00 |
| Steel car axles | 22.50 to | 23.00 |
| No. 1 busheling | 16.50 to | 17.00 |
| No. 2 busheling | 12.50 to | 13.00 |
| Pipes and flues | 14.50 to | 15.00 |
| No. 1 railroad wrought | 18.50 to | 19.00 |
| No. 2 railroad wrought | 18.25 to | 18.75 |
| No. 1 machinery cast | 20.50 to | 21.00 |
| No. 1 railroad cast | 19.00 to | 19.50 |
| No. 1 agricultural cast | 19.00 to | 19.50 |
| Locomotive tires, smooth | 20.25 to | 20.75 |
| Stove plate | 16.50 to | 17.00 |
| Grate bars | 17.00 to | 17.50 |
| Brake shoes | 16.50 to | 17.00 |

# New York

## Slowing Down in Buying of Pig Iron and Finished Material

NEW YORK, Jan. 13.—The pig iron market is far from active so far as sales are concerned, the total for the past week probably not amounting to more than 5000 tons. Prices continue firm. The most important inquiry pending is from the Worthington Pump & Machinery Corporation, which is in the market for 6000 tons for two plants for delivery in the second quarter and will probably buy a larger tonnage. This inquiry will develop the strength of the market for that delivery. Another company is in the market for 400 tons for second quarter. At Buffalo $23 is the basis and $24 is asked by some companies in eastern Pennsylvania, but there is no assurance that the $23.50 price could not be done.

We quote delivered in the New York district as follows, having added to furnace price $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

| | |
|---|---|
| East. Pa. No. 2, sil. 1.75 to 2.25 | $26.02 |
| East. Pa. No. 1X fdy., sil. 2.75 to 3.25 | 27.52 |
| East. Pa. No. 2X fdy., sil. 2.25 to 2.75 | 26.52 |
| Buffalo, sil. 1.75 to 2.25 | 27.91 |
| No. 2 Virginia, sil. 1.75 to 2.25 | 30.44 |

**Ferroalloys.**—British producers again advanced their asking price yesterday $5 per ton, bringing the quotation to $115, seaboard, duty paid. It is understood that other foreign producers and the domestic sellers have adopted the same quotation. Current demand is confined to carload and small lots, apparently for filling-in purposes. There are no large inquiries before the market and so far as can be ascertained here all recent transactions have been on a basis of $110, seaboard, with the new price not yet established by sales. The spiegeleisen market is quieter with total transactions amounting to only 300 tons the last week at the recently established quotation of $33 to $34, furnace.

**Cast Iron Pipe.**—Prices are unchanged on pressure pipe and firmer than for some time. While there are reports of inquiries in preparation in New England, with the exception of the recent purchases by Boston, but little has appeared from municipal sources. The City of New York, which has a small contract out for bids, involving a few hundred tons of pipe, is expected to come into the market shortly for a sizable tonnage. European pipe is still being offered but no recent awards have been secured. Makers of soil pipe are fairly well booked for the next thirty days and are holding firmly to present discounts.

We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.60 to $55.60; 4-in. and 5-in., $59.60 to $60.60; 3-in., $69.60 to $70.60, with $5 additional for Class A and gas pipe. Discounts on both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 41¼ per cent off list; heavy, 50 to 51¼ per cent off list.

**Warehouse Business.**—Orders have fallen off further while prices remain firm. Some attribute the lull to the check on activities produced by adverse weather. Structural jobs are delayed, manufacturers' deliveries are slow, and this interferes with warehouse demand. Mills being pretty well booked, considerable business might be expected to overflow to the warehouse, but this is not the case. Spring steel is slightly better. After several months of a turbulent market in welded pipe, dealers have adopted a new schedule of discounts, the adjustment being downward. Business in welded pipe is the one bright spot; several orders were placed for 50 to 100 tons and one for 1875 tons, delivery extending over the year. Prices are firm at the new level. For other prices see page 262.

**Finished Iron and Steel.**—The so-called regular consumers are slow to enter the market for their running needs and a general lull in new buying continues. However, companies which have made a practice of covering by contracts report a flow of specifications, but the market generally appears at the moment as having been well sold at the lower levels of 1924, so that now it is a period of digestion. The situation applies in a special way to the fabricated steel field; projects which could be put through on a pound basis were covered, leaving those types of structure coming under a lump sum basis to be figured at more convenience. The General Motors Co. is reported to have purchased a large tonnage of bars on a basis of 2c., Pittsburgh, though the general market is, of course, 2.10c. Any higher prices which may be named are regarded at present as calculated chiefly to establish firmer the 2.10c. level, as no great tonnage has as yet been sold on this basis. The Ford Motor Co. is believed to have only a part of the present quarter's needs covered, the seller not being willing to meet the Ford idea of price. Expectations were that plate mills by this time would be asking 2.10c., but 2c. is still the ruling price. One maker of strip steel reports the current purchasing as quiet but has specifications in sufficient volume to run at a 90 per cent basis through perhaps the entire first quarter. Weakness now and then is uncovered in sheets, but only from two or three mills which apparently still are seeking to enlarge the backlog of orders.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c.; plates, 2.34c. to 2.44c.; structural shapes, 2.34c. to 2.44c.

**Old Material.**—All grades continue substantially unchanged. The recent sale of a small tonnage of No. 1 heavy melting steel to a consumer in New Jersey at $22 per ton delivered seems to give evidence of continued firmness of prices. Dealers and brokers are offering $18.50 to $20 per ton delivered to eastern Pennsylvania users. No. 1 machinery cast is more active than for some time and prices are stronger. No. 1 heavy breakable cast is also firm with as high as $18.50 per ton paid for delivery to some eastern Pennsylvania consumers. Specification pipe is unchanged at about $18 per ton, the buying price delivered eastern Pennsylvania offered by most brokers, with $18.50 offered in some instances. Borings and turnings are still inactive and buying prices range from $13 to $15 per ton delivered, depending upon the consumer. Most users of heavy melting steel in eastern Pennsylvania are fairly well covered at present and not inclined to contract for further shipments, unless there is evidence of the possibility of purchasing at less than the price established by recent sales.

Buying prices per gross ton New York follow:

| | |
|---|---|
| Heavy melting steel, yard | $14.00 to $14.50 |
| Heavy melting steel, railroad or equivalent | 15.50 to 16.50 |
| Rails for rolling | 16.00 to 16.50 |
| Relaying rails, nominal | 24.00 to 25.00 |
| Steel car axles | 21.50 to 22.50 |
| Iron car axles | 27.00 to 28.00 |
| No. 1 railroad wrought | 15.50 to 16.00 |
| Forge fire | 13.50 to 14.00 |
| No. 1 yard wrought, long | 15.00 to 16.00 |
| Cast borings (steel mill) | 11.50 to 12.00 |
| Cast borings (chemical) | 17.00 to 18.00 |
| Machine shop turnings | 12.50 to 13.00 |
| Mixed borings and turnings | 10.50 to 11.00 |
| Iron and steel pipe (1 in. diam., not under 2 ft. long) | 14.25 to 14.75 |
| Stove plate | 12.75 to 13.25 |
| Locomotive grate bars | 14.00 to 14.50 |
| Malleable cast (railroad) | 16.00 to 16.50 |
| Cast iron car wheels | 16.00 to 17.00 |
| No. 1 heavy breakable cast | 14.25 to 14.75 |

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

| | |
|---|---|
| No. 1 machinery cast | $18.50 to $19.00 |
| No. 1 heavy cast (columns, building materials, etc.), cupola size | 16.50 to 17.00 |
| No. 2 cast (radiators, cast boilers, etc.) | 15.50 to 16.00 |

## Power Project of the Stanley Works

The Farmington River Power Co., the majority of whose stock is held by the Stanley Works, New Britain, Conn., will undertake immediately an electrical power project to cost approximately $1,000,000, in which the Farmington River will be harnessed in the town of Windsor, Conn. Most of the output derived, estimated at 8,000,000 kwhr., will be used by the Stanley Works. The erection of a large dam as planned will flood a wide area of waste land and form a lake about three and a half miles long.

# Cincinnati

## Moderate Activity in Pig Iron with Price Trend Upward

CINCINNATI, Jan. 13.—Pig iron sales during the past week ranged from single carloads to 500 tons, both Northern and Southern grades being bought. The largest reported sale was of 500 tons of Southern iron taken by a Louisville melter at $20, Birmingham, for first quarter delivery. A sale of 400 tons of Northern iron for first and second quarters was made at $22.50, Ironton. Smaller sales were made on the basis of $23, Ironton, for first quarter, and one furnace is now asking $23.50 for second quarter. A large producer in the South has named a price of $21 for second quarter, and a Tennessee furnace is quoting $20.50. For first quarter the price ranges from $20 to $20.50, Birmingham. Jackson County silvery producers are now holding to the regular schedule for silvery irons, but Bessemer ferro-silicon prices are being shaded $1 per ton. Announcement of another $5 advance in ferromanganese for first half delivery has been made, making the price $115 furnace.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

| | |
|---|---|
| Southern fdy., sil. 1.75 to 2.25 (base) | $24.05 to $25.05 |
| Southern fdy., sil. 2.25 to 2.75 | 24.55 to 25.55 |
| Southern Ohio silvery, 8 per cent | 32.77 |
| Southern Ohio fdy., sil. 1.75 to 2.25 | 24.27 to 25.27 |
| Southern Ohio, basic (nominal) | 24.27 |
| Southern Ohio, malleable | 24.27 to 25.27 |

**Sheets.**—An order is reported for 1000 tons of sheets at the full schedule, but against this are reports that shading of black and blue annealed sheets has developed. However, in this district prices are fairly steady, quotations being 2.70c. for blue annealed, 3.60c. for black and 4.75c. for galvanized. Automobile body sheets are generally quoted at 4.75c., Pittsburgh.

**Structural Activity.**—A fair amount of activity is reported, including inquiries from railroads for bridge work. A number of projects requiring large tonnages are reported to be getting active, and inquiries are expected shortly. Awards were fairly numerous during the week, 3200 tons having been let.

**Reinforcing Bars.**—Buying has been light. Several buildings have been awarded, but the bars have not been placed. Prices are fairly steady, the usual quotation being 1.95c. mill for hard steel bars, and 2.10c. for bars from new billets.

**Warehouse Business.**—Jobbers report business fairly good since the first of the year, and indications point to further improvement. Prices are very firm, and an advance in cold rolled products, bolts and nuts and wire products is expected.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.15 per 100 lb.; common wire nails, $3.15 per keg base; cement coated nails, $2.85 per keg.

**Finished Materials.**—The demand has been mostly for small tonnages, though it is expected that with inventories completed there will be considerable business placed by consumers who have not covered for their full requirements. Prices are steady in the major products, and while it is still possible to do 2c., Pittsburgh, on plates, some of the larger producers have advanced to 2.10c., Pittsburgh. Bars and shapes are firm at 2.10c., Pittsburgh. There has been little activity in wire products, and prices are firm at $2.60 for plain wire and $2.85 for wire nails, Ironton, basis. The New York Central Lines has closed for its 1925 requirements of track accessories, included in which is a round tonnage for the Big Four Railroad. This business was well distributed. A fair demand for bolts and nuts is reported, with prices steady.

**Coke.**—Demand for foundry grades has been fairly active during the past week. Connellsville coke is moving better than for some time past. Despite the advancing prices, prices generally are unchanged, the range quoted last week, being still effective.

**Old Material.**—There is little selling activity. An offer from the Wheeling district for heavy melting steel at $21.50 delivered, found no takers. Railroad offerings, though fairly heavy, are being quickly absorbed at good prices. Dealers expect an active market to develop in the next few weeks. Prices, while firm, are unchanged.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

| | |
|---|---|
| *Per Gross Ton* | |
| Heavy melting steel | $17.00 to $17.50 |
| Scrap rails for melting | 16.50 to 17.00 |
| Short rails | 20.00 to 20.50 |
| Relaying rails | 31.00 to 31.50 |
| Rails for rolling | 18.50 to 19.00 |
| Old car wheels | 16.00 to 16.50 |
| No. 1 locomotive tires | 19.00 to 19.50 |
| Railroad malleable | 19.00 to 19.50 |
| Agricultural malleable | 18.00 to 18.50 |
| Loose sheet clippings | 13.50 to 14.00 |
| Champion bundled sheets | 14.50 to 15.00 |
| *Per Net Ton* | |
| Cast iron borings | 13.00 to 13.50 |
| Machine shop turnings | 12.00 to 12.50 |
| No. 1 machinery cast | 20.00 to 20.50 |
| No. 1 railroad cast | 17.50 to 18.00 |
| Iron axles | 23.50 to 24.00 |
| No. 1 railroad wrought | 14.00 to 14.50 |
| Pipes and flues | 10.50 to 11.00 |
| No. 1 busheling | 12.50 to 13.00 |
| Mixed busheling | 10.00 to 10.50 |
| Burnt cast | 12.50 to 13.00 |
| Stove plate | 12.50 to 13.00 |
| Brake shoes | 14.00 to 14.50 |

# Boston

## Foreign Pig Iron Becoming More and More a Market Factor

BOSTON, Jan. 13.—The pig iron market is quiet. A Massachusetts heater manufacturer, who was expected to purchase several thousand tons No. 2 plain, for second quarter the past week, has not covered his requirements. Quotations on domestic iron are more or less nominal because of the unwillingness of furnaces to quote for second quarter delivery and because a majority of New England foundries have sufficient iron for first quarter. Foreign iron therefore is becoming more and more a market factor. India iron, in limited quantities, is offered at $25.50, duty paid on dock here, for silicon 2.50 to 3. Continental iron is obtainable on about the same basis. India iron, corresponding with our No. 2 plain, is reported to have sold at $24.50, duty paid dock here. Importations of foreign iron from now on are expected to increase.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

| | |
|---|---|
| East. Penn., sil. 1.75 to 2.25 | $27.15 to $27.65 |
| East. Penn., sil. 2.25 to 2.75 | 27.65 to 28.15 |
| Buffalo, sil. 1.75 to 2.25 | 27.91 |
| Buffalo, sil. 2.25 to 2.75 | 28.41 to 30.93 |
| Virginia, sil. 1.75 to 2.25 | 29.92 to 30.92 |
| Virginia, sil. 2.25 to 2.75 | 30.42 to 31.42 |
| Alabama, sil. 1.75 to 2.25 | 29.60 to 30.10 |
| Alabama, sil. 2.25 to 2.75 | 30.10 to 30.60 |

**Shapes and Plates.**—The market for plates and shapes is firmer, although not actually higher, in that mills are obtaining outside prices more often than inside. Shapes are $2.36½ to $2.46½ per 100 lb. delivered Boston common rate points, or 2c. to 2.10c. Pittsburgh base, and plates $2.46½ to $2.51½ delivered, or 2.10c. to 2.15c., Pittsburgh base. The largest consumers are fairly well covered for first quarter requirements, although individual purchases of shapes and plates as well as of all mill products have been conservative so far this year. New England railroads have not figured prominently in the buying on this movement. The Boston Elevated Railway Co. recently bought a round tonnage of spikes.

**Cast Iron Pipe.**—R. D. Wood & Co. were the low bidders on 600 tons 6-in. to 16-in pipe required by Waterbury, Conn. New Bedford, Mass., has awarded approximately 200 tons of pipe to the United States Cast Iron Pipe & Foundry Co. Foundries are well sold ahead on small pipe, some of them well into September.

Bookings on large sizes are not as extended, yet are heavier than they have been in months. Pipe prices are strong, with indications of being higher within a week or ten days. A fair amount of gas pipe business has been closed in this territory within a month, without open bidding. One of the largest orders placed recently is 550 tons 4-in. to 12-in. by the Lawrence Gas Co., Lawrence, Mass., with the Warren Foundry & Pipe Co.

**Coke.**—An improvement in sentiment among foundries is noted. Daily melts are slowly yet gradually increasing, and orders for castings for immediate and forward delivery are coming out more freely. These conditions are reflected in a larger movement of by-product foundry coke from New England ovens. Foundries as a rule are carrying small coke stocks. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-product foundry coke at $11.50 per ton delivered in New England.

**Old Material.**—The activity of heavy melting steel was the outstanding feature of the old material market the past week. Buying was for Pittsburgh, eastern Pennsylvania and Bridgeport, Conn., consumption. Included in lots purchased for Bridgeport was 1000 tons, barge delivery. Prices paid for material going to Pittsburgh and eastern Pennsylvania averaged $16 to $16.50 on cars, and for Bridgeport, $14 to $14.50. Machine shop turnings and cast iron borings are more active and firmer in price, while mixed borings and turnings are dull and easy. Wrought, forged scrap, bundled skeleton, scrap rail and street car axle values have appreciated slightly. Stove plate for local consumption is inactive, but purchases for Pennsylvania delivery at around $12.60 on cars are reported. Machinery cast is difficult to move, consequently dealers are more inclined to shade prices.

The following prices are for gross ton lots delivered consuming points:

| | |
|---|---|
| No. 1 machinery cast | $19.50 to $20.50 |
| No. 2 machinery cast | 17.00 to 18.00 |
| Stove plates | 15.00 to 15.50 |
| Railroad malleable | 20.00 to 20.50 |

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

| | |
|---|---|
| No. 1 heavy melting steel | $16.00 to $16.50 |
| No. 1 railroad wrought | 16.50 to 17.00 |
| No. 1 yard wrought | 15.50 to 16.00 |
| Wrought pipe (1-in. in diam., over 2 ft. long) | 13.50 to 14.00 |
| Machine shop turnings | 12.25 to 12.50 |
| Cast iron borings, chemical | 16.50 to 16.75 |
| Cast iron borings, rolling mill | 11.50 to 12.00 |
| Blast furnace borings and turnings | 9.50 to 10.00 |
| Forged scrap | 12.50 to 13.00 |
| Bundled skeleton | 12.00 to 13.00 |
| Bundled cotton ties | 11.00 to 11.25 |
| Forged flashings | 12.50 to 13.00 |
| Shafting | 20.00 to 20.50 |
| Street car axles | 19.50 to 20.00 |
| Rails for rerolling | 16.50 to 17.00 |
| Scrap rails | 16.00 to 16.50 |

# St. Louis

## Active Demand for Spot Iron—One Sale for Second Quarter

ST. LOUIS, Jan. 13.—The first sale of consequence of pig iron for second quarter delivery was made by the St. Louis Coke & Iron Co., amounting to 2000 tons of foundry and wheel iron at $25 base, f.o.b. Granite City. However, the outstanding feature of the situation in this market is the demand for spot iron. One concern sold 1000 tons of spot iron during the last week, including seven carloads of Southern make shipped on consignment. A Southern maker also reports a good business in spot iron. It is believed that there will be considerable business done during January and February in small lots for quick shipment to melters, whose first quarter requirements will be greater than their purchases on account of their doing a better business than they expected, and in special lots needed to balance up mixtures. There is a demand for anticipation of contracts as a result of the good business melters are enjoying. Stove plants in the district are closed for inventory, but other melters are operating with a large order file. The market is firm, with the local melter quoting $25 to $26, Granite City; Northern iron at $24, Chicago, and Southern at $21 to $22, Birmingham, a leading independent quoting the higher price.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

| | |
|---|---|
| Northern fdy., sil. 1.75 to 2.25 | $26.66 |
| Northern malleable, sil. 1.75 to 2.25 | 26.66 |
| Basic | 26.66 |
| Southern fdy., sil. 1.75 to 2.25 (rail) | $26.17 to 27.17 |
| Southern fdy., sil. 1.75 to 2.25 (rail and water) | 24.28 to 25.28 |
| Granite City iron, sil. 1.75 to 2.25 | 24.81 to 25.31 |

**Finished Iron and Steel.**—The Laclede Steel Co. got the order for 900 tons of reinforcing bars for the Famous & Barr Co. warehouse, previously reported as a structural project, and 500 tons for the Fort Worth (Texas) Club. No new railroad inquiries have been issued, and small orders rule in other lines.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.65c.; cold rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, ⅞ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, $3.50; hexagons, blank or tapped, $4 off list.

**Coke.**—Producers of by-product coke in the St. Louis district report that there is a much better demand for foundry grades. The colder weather has stimulated the demand for domestic grades.

**Old Material.**—Advances of 50c. to $1 a ton are reported in the market for old material. Consumers in the St. Louis industrial district have been buying considerable scrap and added strength is given to the market by the attitude of dealers, who are extremely bullish, and are competing keenly for material. New railroad lists during the week include: Mobile & Ohio, 500 tons of miscellaneous scrap and 400 tons of relaying rails; Kansas City Southern, 2000 tons; Missouri-Kansas-Texas, 1600 tons; Chicago & Alton, 1800 tons; Pullman Co., St. Louis, 500 tons; Chicago, Milwaukee & St. Paul, 700 tons; Southern Railway, subsidiaries, 650 tons; St. Louis & San Francisco, 700 tons, and San Antonio & Aransas Pass, 1200 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

| | |
|---|---|
| *Per Gross Ton* | |
| Iron rails | $18.00 to $18.50 |
| Rails for rolling | $21.50 to $22.00 |
| Steel rails less than 3 ft. | 21.50 to 22.00 |
| Relaying rails, 60 lb. and under | 25.00 to 26.00 |
| Relaying rails, 70 lb. and over | 32.50 to 33.50 |
| Cast iron car wheels | 21.00 to 21.50 |
| Heavy melting steel | 18.00 to 18.50 |
| Heavy shoveling steel | 17.50 to 18.00 |
| Frogs, switches and guards cut apart | 20.50 to 21.00 |
| Railroad springs | 22.00 to 22.50 |
| Heavy axles and tire turnings | 14.00 to 14.50 |
| No. 1 locomotive tires | 20.00 to 20.50 |
| *Per Net Ton* | |
| Steel angle bars | 18.00 to 18.50 |
| Steel car axles | 21.00 to 21.50 |
| Iron car axles | 26.00 to 26.50 |
| Wrought iron bars and transoms | 21.00 to 21.50 |
| No. 1 railroad wrought | 16.50 to 17.00 |
| No. 2 railroad wrought | 16.00 to 16.50 |
| Cast iron borings | 12.50 to 13.00 |
| No. 1 busheling | 16.50 to 17.00 |
| No. 1 railroad cast | 18.25 to 18.75 |
| No. 1 machinery cast | 19.50 to 20.00 |
| Railroad malleable | 17.00 to 17.50 |
| Machine shop turnings | 9.50 to 10.00 |
| Champion bundled sheets | 10.00 to 10.50 |

The first pipe to be made at the new plant of the Gary Tube Co., Gary, Ind., subsidiary of the National Tube Co., was rolled on Jan. 8. The No. 4 lapwelded mill was the first unit to get into production. Other units will be placed in operation from now on and it is expected to have the entire plant in regular production before spring.

The Ford Motor Co., Detroit, is perfecting plans for the construction of a new hydroelectric generating plant on the Huron River, near Ypsilanti, Mich., with initial output of about 700 hp., using two 350-hp. turbo-generators. A power dam will be built, with backwater to form an artificial lake about three miles long, covering close to 1000 acres.

# Birmingham

## Pig Iron Sales Confined Largely to Small Lots —Prices Firm

BIRMINGHAM, ALA., Jan. 13—While pig iron selling in the main is in small lots, with an occasional deal for a few hundred tons above the average amount, the market here is considered very strong and quotations showing an upward trend. The greater portion of the business is on a $20.50 per ton base for No. 2 foundry, with another advance of 50c. believed coming for the near future. Melt of iron in the home territory continues steady, the various iron melting companies having apparently much business in hand. This is a fact with the cast iron pipe concerns, both gas and water, and the soil pipe makers, the larger consumers of pig iron. Several of the soil pipe makers report no stock on hand and shipments now equal to production. The gas and water pipe companies have not piled stock for some time. All available blast furnaces of the district are to be gotten in shape for operation. Need of basic iron is increasing. The Gulf States Steel Co. has its fifth open-hearth furnace in operation at its Gadsden mill. The sixth furnace will be held in readiness to relieve one of the others.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

| | |
|---|---|
| No. 2 foundry, 1.75 to 2.25 sil. | $20.00 to $20.50 |
| No. 1 foundry, 2.25 to 2.75 sil. | 20.50 to 21.00 |
| Basic | 20.00 to 20.50 |
| Charcoal, warm blast | 30.00 |

**Cast Iron Pipe.**—Lettings are again reported the past week by the large size cast iron pipe producers in this district with more specifications still in sight. Winter buying promises to be good and all plants hope to be able to maintain a steady pace through the winter. Quotations are still on the $40 per ton base, 6-in. and over pipe. No stock is accumulating with the pipe producers and considerable unfilled tonnage is reported.

**Finished Material.**—The smaller shapes of steel are selling readily and shipments are in excess of the make. Soft steel bars are quoted at 2.25c., Birmingham.

**Coke.**—The demand for coke is considerably improved and increased production is noted. The Sloss-Sheffield Steel & Iron Co. is having some coke manufactured at the Semet-Solvay Co. by-product plant at Ensley, and the Sloss-Sheffield company's by-product plant at North Birmingham is operating to capacity also. The Alabama By-Product Corporation, independent, is shipping all of its output steadily. But two companies are making coke now by the beehive oven method in this district. Their product is being marketed promptly. Coke prices continue at from $4.50 to $5 the ton.

**Old Material.**—Considerable old material is moving in this district, mainly on contracts booked during December. A little business is offering week after week, but the dealers are working on contracts in hand and at the same time keeping a steady watch on the market. The limits of the market of the old material dealers of this district are restricted by reason of freight rates.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

| | |
|---|---|
| Cast iron borings, chemical | $15.00 to $16.00 |
| Heavy melting steel | 15.00 to 15.50 |
| Railroad wrought | 14.00 to 15.00 |
| Steel axles | 18.00 to 19.00 |
| Iron axles | 19.00 to 20.00 |
| Steel rails | 15.00 to 15.50 |
| No. 1 cast | 17.00 to 17.50 |
| Tramcar wheels | 17.00 to 17.50 |
| Car wheels | 16.00 to 17.00 |
| Stove plate | 15.00 to 16.00 |
| Machine shop turnings | 8.00 to 9.00 |
| Cast iron borings | 8.00 to 9.00 |
| Rails for rolling | 15.50 to 16.50 |

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The Cleveland-Cliffs Iron Co., Cleveland, has purchased a coal dock at Escanaba, Mich., owned by the Chicago, Milwaukee & St. Paul Railroad. The dock will be remodeled and will supply the mines of the Cleveland-Cliffs company with coal. The dock has a capacity of 100,000 tons.

# San Francisco

## Shapes and Plates Advanced—Warehouse Prices Higher—Current Business Quiet

SAN FRANCISCO, Jan. 10 (*By Air Mail*)—Price advances of $1 in both plates and shapes, higher warehouse prices for bolts, merchant bars, band steel, sheets, plates, angles, channels, tees, etc., and a general stiffening of prices in all lines, were the outstanding developments of the past week. Current interest is comparatively quiet, and as a result, new quotations have not as yet been tested. It is generally conceded, however, that business during the next few weeks will be transacted on higher price levels.

A number of fairly large structural projects are pending, and will probably be closed within a short time. Inquiries for two jobs, involving about 500 tons of structural steel, were made during the week, but no large tonnages were booked, with the exception of two jobs in LosAngeles for an aggregate of about 800 tons.

The present temporary lull in this market may be attributed to two things: To the usual slackness that comes around the first of the year at the inventory period, and to the fact that buyers, for the most part, have covered on their requirements rather heavily for the first quarter.

**Pig Iron.**—Rumors of higher prices are prevalent, but no actual price advance has been made, as yet, in this market. Current quotations are very firm, but have not been severely tested because buyers have covered on their first quarter needs, and there is not, at present, any large amount of business being done. The supply of foreign iron available is limited, although a shipment of about 2000 tons of Dutch foundry iron is en route. Current quotations are as follows:

| | Per Ton |
|---|---|
| *Utah basic | $27.25 to $28.25 |
| *Utah foundry, sil. 1.75 to 2.25 | 27.50 to 28.50 |
| **Scotch foundry | 29.50 to 30.50 |
| **English foundry | 28.50 to 30.00 |
| **Belgian foundry | 26.00 to 28.00 |
| **Indian foundry | 26.00 to 28.00 |
| *Dutch foundry | 26.00 |
| *Birmingham, Ala., foundry, sil. 2.75 to 3.25 | 31.00 |

*Delivered in San Francisco.
**Duty paid, f.o.b. cars, San Francisco.

**Ferroalloys.**—Swedish ferrosilicon was quoted during the past week at $86, duty paid, which is a lower figure by $2 than was quoted a week ago. As a result a few inquiries were made, but there is very little to be had at present. One importer has been unable to get an order filled by a furnace which has been supplying him for sometime. English ferromanganese is steady at $112.50 duty paid this port.

**Plates.**—A price advance of $1 was made during the past week making the current quotations 2.50c. to 2.55c. c.i.f. Further price advances are considered likely in the near future. No large awards were made during the week, although several jobs calling for fairly large tonnages are pending. New inquiries during the week call for about 600 tons.

**Shapes.**—Quotations were advanced $1, and are now 2.50c. to 2.55c. c.i.f. No jobs were awarded in this district involving large tonnages. About 800 tons were placed in Los Angeles. Inquiries for about 600 tons were made, and several fairly large projects are pending. There are indications which lead to the belief that prices will go to higher levels in the near future. Waterfront improvements in this city now under construction exceed in value $6,500,000.

**Sheets.**—Interest on the part of buyers at present is more or less confined. Mill prices are firm but unchanged. Warehouse prices have been advanced, because competitive conditions locally are somewhat less stringent. Warehouse prices on galvanized sheets were advanced 20c. per 100 lb., and on both black and blue annealed a price advance of 25c. per 100 lb. has been made. Mill prices are as follows: No. 10 blue annealed, 3.425c., c.i.f., No. 28 black, 4.33c., c.i.f., No. 28 galvanized, 5.485c., c.i.f.

**Tin Plate.**—A large Alaskan canner has placed an

order with an Eastern manufacturer calling for 16,000 to 20,000 base boxes, for first quarter delivery.

**Bolts and Nuts.**—In view of the fact that during the past three months prices have been advanced approximately 50 per cent, no large volume of business is expected in the immediate future, although a few large orders have been placed recently in Los Angeles. The current base quotation for bolts is 50, 10 and 10 per cent off, Eastern area. Warehouse prices are firmer.

**Bars.**—Warehouse prices for merchant bars have been advanced 15c., base, making the current quotation $3.15, base, warehouse, l.c.l. Soft steel bands are now $4, base, l.c.l. warehouse. No price change has been made in reinforcing bars, which are still 3.35c., base, carload, and 3.80c., base, l.c.l. Reinforcing awards during the past week called for about 900 tons, among which were the following:

Bekins Van and Storage Co., Fresno, 300 tons, to Kyle & Co.
Wilson Theater, Fresno, 450 tons, to Kyle & Co.
Firemens' Fund Building extension, San Francisco, 100 tons to Badt-Falk Co.

**Rails.**—The Little River Redwood Co. has placed an order for 100 tons of 60-lb. foreign rails at about $36.18, f.o.b. incoming dock.

**Coke.**—Prices are firm, although the recent advances made in domestic coke have not been fully tested because the demand is limited. Foreign coke is in about the same position. A shipment of about 4000 tons of English coke is en route. Birmingham, Ala., by-product coke is quoted at $18.50 to $20.50 delivered. West Virginia beehive is $28, delivered, Wise County, Va., beehive is $22. English beehive is quoted at $16 to $18, depending on the structure, and English by-product is about $14.

# Buffalo

## Pig Iron Sales Amount to Fair Tonnage at Unchanged Prices

BUFFALO, Jan. 13.—Sales over the past week or ten days totaled 14,000 tons, including three lots for 1000 tons each. Two of these were foundry and one was malleable. The malleable order was from the Far West and one of the 1000-ton lots of foundry was from downstate. The interest which booked this business sold about 2000 tons additional in miscellaneous lots. Another interest took 2000 tons of business, including one for 500 tons of foundry. The selling was for first and second quarter, most of the furnaces being willing to sell at $23 for second quarter, though they have been turning down last half business offered at this figure, relying on an upward trend to the market. An inquiry for 3000 tons of basic has appeared. Of the inquiry noted last week no decision has yet been made to buy by the consumer asking for 2000 tons and the 4000-ton lot is believed to have been placed but did not come to this district. The $23 price appears to be firm with $23.50 for No. 2 foundry and $24.50 for No. 1 foundry. The Lackawanna plant of the Bethlehem Steel Co. is preparing to put a seventh stack in blast and another interest is preparing to increase its furnace operations.

We quote prices f.o.b. gross ton, Buffalo, as follows:

| | |
|---|---|
| No. 2 plain, sil. 1.75 to 2.25 | $23.00 |
| No. 2 foundry, sil. 2.25 to 2.75 | 23.50 |
| No. 1 foundry, sil. 2.75 to 3.25 | 24.50 |
| Malleable, sil. up to 2.25 | 23.00 |
| Basic | 23.00 |
| Lake Superior charcoal | 29.28 |

**Finished Iron and Steel.**—Mills have comfortable backlogs and there is less evidence of a disposition to press for business. Operation is 75 to 78 per cent and specification is accounted good. Prices are firm. Industries in the metal trades are operating at a somewhat higher rate than at any time in the past ten months, nearly all of them showing a substantial improvement in the clip of operation. Attractive bar tonnages now being offered is operating against disposition to take on new tonnages of semi-finished material, and this has brought about advances in the sheet bar and billet prices in the case of new inquiry. Stiffening of sheet bar prices is causing some stiffening tendency in the price of black sheets, though 3.50c. to 3.60c. is still being quoted.

**Old Material.**—The market is fairly quiet. Cleveland has resumed buying of mixed turnings and borings at a price of $17.50 to $17.75, or about $15 to $15.50 Buffalo, and this market is being combed now to supply this demand. One of the local mills is reported to have taken a round tonnage of heavy melting steel at a price of $19.50 to $20, and this will take considerable of this material out of the market for some time. Demand for specialty scraps is not heavy. One of the local consumers is in the market for stove plate from time to time. All prices are firm at the mark-up last week.

We quote f.o.b. gross ton, Buffalo, as follows:

| | |
|---|---|
| Heavy melting steel | $19.50 to $20.00 |
| Low phosphorus, 0.04 and under | 22.50 to 23.50 |
| No. 1 railroad wrought | 16.50 to 17.00 |
| Car wheels | 17.50 to 18.00 |
| Machine shop turnings | 14.25 to 14.75 |
| Cast iron borings | 14.50 to 15.00 |
| No. 1 busheling | 18.50 to 19.50 |
| Stove plate | 16.50 to 17.00 |
| Grate bars | 14.50 to 15.00 |
| Bundled sheets | 14.00 to 15.00 |
| Hydraulic compressed | 18.50 to 19.00 |
| Railroad malleable | 20.50 to 21.00 |
| No. 1 machinery cast | 18.50 to 19.00 |

# Cleveland

## Renewed Activity in Pig Iron—Buying of Steel Not Heavy

CLEVELAND, Jan. 13.—Mills continue to book a fair volume of specifications on contracts, although orders are not so heavy as they were late in December. Some of the buyers who are ordering only from month to month are now sending in specifications for February shipments. Deliveries are getting somewhat slower and now range from three to four weeks on steel bars and structural material. While some of the larger mills can make quicker shipments on plates, a local plate mill is filled up for six weeks. With most consumers under contract now, business is light, although some small lot orders are being placed from day to day. Manufacturing plants in the metal working field are getting somewhat busier than they were late last year, but their increased production has come mostly from operating longer hours rather than increasing working forces. Another lull has developed in structural steel, but a good volume of work is in prospect in the building field and steel bars for reinforcing work have become more active.

The steel market is firm, with prices well established at recent levels, and there is a disposition among leading sellers not to force prices higher.

**Pig Iron.**—The market has become somewhat more active following the holiday lull. Cleveland interests made sales aggregating 25,000 tons during the week. A Canton consumer purchased 10,000 tons of basic not included in the above total from a Valley producer at $22. The larger share of the business the past week was in second quarter contracts and one producer still has inquiries for 15,000 tons, mostly for the second quarter. One of these is for 3,000 to 5,000 tons of foundry iron. Sales include a 2,000 ton lot of foundry and malleable iron to an Indiana melter, and a Kokomo stove foundry is inquiring for 1,000 tons of foundry iron. Prices show a firmer tendency. For Cleveland delivery foundry and malleable iron is up 50c. a ton to $23.50 at furnace for local delivery and one producer who has been out of the market for several weeks is asking $24. One Lake furnace interest is still quoting $23 for foundry and malleable grades for the first quarter, but has advanced to $23.50 for the second quarter. While sales have been made at the high price, this advance was not definitely established during the week, as Lake furnaces took some second quarter business at $23. In the Valley district, the market appears established at $23 for the second quarter. If there is any $22.50 Valley iron left, it is only for the first quarter. Some furnaces are now asking as high

as $23 for basic iron. A Valley furnace reports sales of low phosphorous iron aggregating 5,000 tons at $29. These included a 2,000 ton lot purchased by a northern Ohio consumer. Bessemer iron brought $23.50, Valley furnace, in the sale of 500 tons. Pickands Mather & Co. blew in their B furnace in Toledo early this week. This furnace has been rebuilt and enlarged.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

| | |
|---|---|
| Basic, Valley furnace | $22.00 to $22.50 |
| N'th'n No. 2 fdy., sil. 1.75 to 2.25 | 24.00 |
| Southern fdy., sil. 1.75 to 2.25 | 26.01 to 26.51 |
| Malleable | 24.00 |
| Ohio silvery, 8 per cent | 33.52 |
| Standard low phos., Valley furnace | 29.00 |

**Iron Ore.**—Ore men generally regard it as settled that there will be some advance in ore prices for 1925 and interest is now centered in what the advance will be. Some expect prices will be marked up 50c. a ton, others look for only a 30c. advance and others are at least hopeful that the advance will be 80c., bringing prices back to those that prevailed in 1923. Some furnace owners are getting anxious to know what the prices will be, as they are now selling pig iron for the second quarter and some of this year's ore will be used in pig iron made in the latter part of May and in June. However, ore men are in no hurry to name prices and it will probably be several weeks before the new schedule is announced. Furnaces are now figuring out their mixtures and no definite inquiries have as yet come out for ore, although a few reservations have been made. Ore companies are looking for a good year and predictions are made that the season's movement will reach 60,000,000 tons and may run to 62,000,000 tons. Shipments of ore from Lake Erie docks during December amounted to 732,419 tons, leaving a dock balance Jan. 1 of 7,346,037 tons as compared with 8,049,276 tons on Dec. 1, and with 7,981,432 tons on Jan. 1, 1924. Shipments from Lake Erie docks for the reason were 22,840,927 tons as compared with 33,503,976 tons during the previous year. Receipts at these docks for the year were 31,576,103 tons as compared with 43,666,071 tons during 1923.

**Bolts, Nuts and Rivets.**—Makers are well filled with orders for bolts and nuts placed against fourth quarter contracts and some new business is coming out. Prices are firm. Most rivet consumers have placed contracts for the first quarter at prevailing prices. Rivet specifications are fair.

**Semi-Finished Steel.**—The supply is scarce but no further test of prices is reported. A local maker continues to hold to $40, Cleveland, for sheet bars, billets and slabs. Consumers are well covered for the first quarter and little inquiry is coming out.

**Steel Bars, Plates and Structural Material.**—Steel bars and structural material are firm at 2.10c., Pittsburgh. On plates, 2c. is the minimum price, and some mills are on a 2.10c. basis, at which sales are being made. An Eastern mill is now asking 2.20c., but is unable to make sales at that price in this territory.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 1 in. and wider and 20 gage and heavier, 3.85c.; narrower than 1 in., all gages, 4.35c.; No. 9 annealed wire, $3.15 per 100 lb.; No. 9 galvanized wire, $3.60 per 100 lb.; common wire nails, $3.25 base per 100 lb.

**Sheets.**—Most mills are well filled with orders taken at the old prices, and sales at the advance in prices have been rather light. Quotations of 3.50c. on black and 4.60c. on galvanized sheets are still appearing for early shipment. Blue annealed and auto body sheets are holding firmly to the regular schedule.

**Strip Steel.**—There is still some irregularity in hot-rolled strip steel, with quotations of 2.25c. appearing when the material carries good extras. Bands at 2.40c. and hoops at 2.50c., Pittsburgh, are unchanged. On cold-rolled strip steel 4c., Cleveland, is still the more common price.

**Reinforcing Bars.**—Inquiries for reinforcing bars show an improvement. New work includes 600 tons for a sewerage disposal plant in Canton, Ohio, 1000 tons for a warehouse for the Smith Hardware Co., Columbus, Ohio, and 750 tons for a factory for the Lilley Co., Louisville, Ky. Prices are unchanged at 2.10c., Pittsburgh, for new billet steel bars and 1.90c. to 2c. for rail steel bars.

**Coke.**—The foundry coke market is firm and the demand fair. Prices are unchanged at from $5.25 to $5.75 for standard Connellsville foundry coke for prompt shipment or contract.

**Old Material.**—The market was active during the week and prices again advanced from 25c. to $1 a ton. A Cleveland mill purchased about 16,000 tons of machine shop turnings at $17.50 to $18 delivered and several thousand tons of heavy melting steel was bought by other Cleveland mills at $21 to $21.50 delivered. The buyer of turnings had to pay about the usual market quotations to bring out a round tonnage, and turnings in car lots are now moving around $17 to $17.25. Heavy melting steel offered by the Pennsylvania Railroad last week is understood to have brought $23 in the Valley and Pittsburgh districts.

We quote dealers' prices f.o.b. Cleveland per gross ton:

| | |
|---|---|
| Heavy melting steel | $20.50 to $20.75 |
| Rails for rolling | 20.50 to 20.75 |
| Rails under 3 ft | 22.00 to 22.50 |
| Low phosphorus melting | 22.25 to 23.00 |
| Cast iron borings | 16.75 to 17.00 |
| Machine shop turnings | 16.75 to 17.00 |
| Mixed borings and short turnings | 16.75 to 17.00 |
| Compressed sheet steel | 18.00 to 18.50 |
| Railroad wrought | 17.50 to 17.75 |
| Railroad malleable | 22.00 to 22.50 |
| Light bundled sheet stampings | 15.50 to 16.00 |
| Steel axle turnings | 18.00 to 18.50 |
| No. 1 cast | 20.00 to 20.50 |
| No. 1 busheling | 16.50 to 16.75 |
| Drop forge flashings | 15.75 to 16.00 |
| Railroad grate bars | 16.50 to 17.00 |
| Stove plate | 16.50 to 17.00 |
| Pipes and flues | 15.00 to 15.25 |

## Detroit Scrap Market

DETROIT, Jan. 13.—With several of the mills and furnaces in the Cleveland and Valley district having bought considerable tonnage, there has been a slight lull in activity in the Detroit scrap market. There is every evidence of strength and prices of a week ago are holding with the exception of borings and short turnings which registered prices of $14.25 to $14.75, a decline of 25c. from previous maximum, and hydraulic compressed showed $17.25 to $17.75, a drop of 50c. from the high point of a week ago.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

| | |
|---|---|
| Heavy melting steel | $18.50 to $19.25 |
| Shoveling steel | 18.50 to 19.25 |
| Borings and short turnings | 14.25 to 14.75 |
| Long turnings | 14.00 to 14.50 |
| No. 1 machinery cast | 18.50 to 19.00 |
| Automobile cast | 19.50 to 20.50 |
| Hydraulic compressed | 17.25 to 17.75 |
| Stove plate | 16.50 to 17.50 |
| No. 1 busheling | 14.75 to 15.25 |
| Sheet clippings | 13.50 to 14.25 |

## Wages of Sheet Mill Workers Reduced Owing to Low Prices Made

YOUNGSTOWN, Jan. 13.—Indicating that Midwestern sheet and tin plate manufacturers accepted business at reduced levels for shipment in November and December in order to fill order books is the 3.40c. per lb. average selling prices on numbers 26, 27 and 28 gage black sheets shipped during the 60 days ending Dec. 31. This price disclosed today at the bi-monthly settlement between the Western Sheet and Tin Plate Manufacturers Association and the Amalgamated Association of Iron, Steel ad Tin Workers is a reduction from 3.45c., the average two months ago.

Tonnage rates of affected workers therefore decline 1½ per cent for January-February, 37½ per cent above base. James H. Nutt of Youngstown represented the manufacturers at the settlement and M. F. Tige of Pittsburgh, president of the Amalgamated Association, headed a committee acting for employees. Shipments showed a substantial gain for the period over the preceding business monthly period.

# Philadelphia

## Active Mill Operations, but New Buying Light —Pig Iron Market Quiet

PHILADELPHIA, Jan. 13.—All markets are pervaded by an atmosphere of optimistic expectancy. Current business is confined to small tonnages, but mills are working on from 30 to 60 days of rolling and holding firmly to quotations on finished products, expecting a renewal of purchasing with the conclusion of the season of inventory, by which time, it is believed many consumers will have specified such a large part of their first quarter contracts as to justify further buying. Pig iron continues quiet, consumers, as a rule, being well covered for first quarter and not particularly pressing for delivery. While a movement to buy for second quarter is expected to develop before long, it is believed by some that part of the first quarter tonnage on many contracts may be carried over into the early part of second quarter.

Much of the present activity is still being contributed by the railroads, purchasers of small tonnages of iron and steel bars, plates, billets, spikes and pig iron. One railroad in this district closed recently on 1000 kegs of spikes and another distributed 1500 tons of plates among eastern Pennsylvania mills. The Pennsylvania Railroad, recently purchaser of about 3000 tons of basic, closed last week on about 2000 tons of foundry iron.

**Pig Iron.**—Most of the current purchasing seems to be of an emergency nature, consisting of small tonnages to fill out first quarter requirements. As a rule, buyers are not pressing for delivery on contracts and in certain instances ask for brief delay in making shipments. Occasional inquiries for second quarter are reported, but little of importance has thus far been closed for this delivery. Basic is quiet but firm in the face of light buying. Foundry is slightly more active, almost entirely in small lots. Although a number of furnaces are holding firmly to $24 base on foundry, $23.50 is still obtainable. A recent purchase of 2000 tons of slightly better than No. 2X foundry by the Pennsylvania Railroad is understood to have gone to a central Pennsylvania furnace. While there has not been any sizable tonnage of foreign iron offered to consumers, certain dealers and brokers are understood to have contracted for fair tonnages, which may be offered later in the year. Although further advances in pig iron are expected, it is pointed out that the increased cost of coke and the possibility of higher ore will result in little or no additional profit to the furnaces. With the Port Henry, N. Y., furnace blown in last week, Wharton scheduled for early blast and other furnaces being considered for operation, the prospective increased production is not viewed with entire equanimity in some quarters.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

| | |
|---|---|
| East. Pa. No. 2 plain, 1.75 to 2.25 sil. | $24.26 to $25.13 |
| East. Pa. No. 2X, 2.25 to 2.75 sil. | 25.01 to 25.88 |
| East. Pa. No. 1X | 26.01 to 26.88 |
| Virginia No. 2 plain, 1.75 to 2.25 sil. | 29.17 to 29.67 |
| Virginia No. 2X, 2.25 to 2.75 sil. | 29.67 to 30.17 |
| Basic delivered eastern Pa. | 24.25 to 24.75 |
| Gray forge | 24.00 to 24.50 |
| Malleable | 24.50 to 25.00 |
| Standard low phos. (f.o.b. furnace) | 25.50 to 26.50 |
| Copper bearing low phos. (f.o.b. furnace) | 25.50 to 26.00 |

**Bars.**—Most mills are working on 40 to 60 days rollings of steel bars and the leading independent is understood to have full rolling schedule on certain sizes for first quarter. New business, however, is light, as most consumers are well covered at the old prices. The market is firm at 2.10c. per lb., Pittsburgh. Iron bars are quiet, the larger part of the demand since the first of the year being confined to the railroads. Recent sales of iron bars, delivered Philadelphia, have established 2.28c. per lb., base.

**Shapes.**—Although makers are in most instances quoting 2.10c. per lb., Pittsburgh, resales of shapes contracted for in the closing months of last year at lower prices, have aided in a continuation of the 2c. per lb. minimum. It is claimed that small tonnages have been sold by fabricators, who found that they had contracted for more than their immediate requirements.

**Plates.**—Quotations range from 2c. to 2.10c. per lb., Pittsburgh, the higher price being made on the smaller and less favorable tonnages. The recent purchase of 1500 tons of plates by the Philadelphia & Reading, distributed among several eastern Pennsylvania mills, established a minimum of 2c. per lb. base, Pittsburgh.

**Warehouse Business.**—Inquiries are for larger lots than for some time, but the total of business is still small. With more satisfactory orders in prospect, there has been a slight inclination at times to shade quotations. Swedish iron is off 50c. per 100 lb., now being quoted at 6.50c. per lb., base.

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.10c.; tank steel plates, ⅛ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.85c.; galvanized sheets, No. 28 gage, 6c.; square twisted and deformed steel bars, 2.85c.; structural shapes, 3.10c.; diamond pattern plates, ¼-in., 5.30c.; ⅜-in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.15c.; squares and hexagons, cold-rolled steel, 4.65c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 3.95c.; narrower than 1 in., all gages, 4.45c.; steel bands, No. 12 gage to ⅞ in., inclusive, 3.95c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

**Ferromanganese.**—Effective Jan. 12, ferromanganese was advanced another $5 a ton to $115 per ton, seaboard or domestic furnace. As the majority of users are well covered for first quarter this is applicable to second quarter purchases. Business is still confined to small lots, with an occasional purchase of as much as 100 tons.

**Old Material.**—Purchasing is confined to small tonnages, most mills being well covered for present requirements. No. 1 heavy melting steel is quotable at $19 to $21, delivered eastern Pennsylvania. Occasional sales of small lots are made at $22 per ton, notably one to a New Castle consumer and several thousand tons to a New Jersey user. As these purchases were somewhat special in their circumstances, they are not considered to have established the market at the higher level. The tonnage of scrap offered by the Pennsylvania Railroad, bids on which were opened Jan. 7, went to a Pittsburgh purchaser, the rail steel bringing about $22.50 per ton delivered. Rolling mill turnings, inactive for some time, recently sold as high as $18 per ton. Heavy axle turnings show an advance of 50c. a ton. Other grades are unchanged.

**Imports.**—In the week ended Jan. 10, 5104 tons of pig iron arrived at the port of Philadelphia; 3603 gross tons from the United Kingdom and 1501 tons from India. Iron ore imports were heavy, totaling 11,935 tons from Algeria. A total of 6000 tons of manganese ore arrived from West Africa, 6700 tons of chrome ore from Portuguese Africa and 481 tons of ferromanganese from the United Kingdom. In finished material there was 308 tons of structural steel from Belgium and 30 tons of hoops from the United Kingdom.

We quote for delivery at consuming points in this district as follows:

| | |
|---|---|
| No. 1 heavy melting steel | $19.00 to $21.00 |
| Scrap rails | 20.00 to 21.00 |
| Steel rails for rolling | 20.00 to 21.00 |
| No. 1 low phos., heavy 0.04 and under | 24.00 to 25.00 |
| Couplers and knuckles | 22.50 to 23.50 |
| Rolled steel wheels | 22.50 to 23.50 |
| Cast-iron car wheels | 19.50 to 20.00 |
| No. 1 railroad wrought | 21.00 to 22.00 |
| No. 1 yard wrought | 18.00 to 19.00 |
| No. 1 forge fire | 17.50 to 18.00 |
| Bundled sheets (for steel works) | 17.00 to 17.50 |
| Mixed borings and turnings (for blast furnace use) | 13.50 to 15.50 |
| Machine shop turnings (for steel works use) | 17.00 to 17.50 |
| Machine shop turnings (for rolling mill use) | 17.00 to 18.00 |
| Heavy axle turnings (or equivalent) | 18.50 to 19.00 |
| Cast borings (for steel works and rolling mill) | 16.00 to 16.50 |
| Cast borings (for chemical plants) | 21.00 to 22.00 |
| No. 1 cast | 20.50 to 21.00 |
| Heavy breakable cast (for steel plants) | 18.50 to 19.00 |
| Railroad grate bars | 17.00 to 18.00 |
| Stove plate (for steel plant use) | 16.50 to 17.00 |
| Wrought iron and soft steel pipes and tubes (new specifications) | 18.00 to 18.50 |
| Shafting | 25.50 to 26.50 |
| Steel axles | 25.50 to 26.50 |

## Control of Tod-Stambaugh Co. Acquired by M. A. Hanna Co.

CLEVELAND, Jan. 13.—Control of the Tod-Stambaugh Co., Cleveland, one of the oldest firms engaged in the Lake Superior iron ore industry, has been acquired by the M. A. Hanna Co., Cleveland, through the purchase of the stock of Frank Billings, the president, who desired to dispose of his interest in order to retire from active business. Carmi A. Thompson, the vice-president, will succeed Mr. Billings as president. The company will continue its corporate existence for several years at least, but its ore sales will be handled by the ore sales department of the Hanna company.

The Tod-Stambaugh Co. was organized shortly after the Civil War. It operates four mines in the Mesabi district and one mine in the Iron River district.

## British Pig Iron and Steel in December

LONDON, ENGLAND, Jan. 13 (*By Cable*).—The pig iron production in December was 580,300 gross tons, a slight decrease from the November output of 583,500 tons. The total steel output in December was 551,000 tons, comparing with 672,800 tons in November.

Comparative production figures for the British steel industry in gross tons per month are as follows:

| | Pig Iron | Steel Ingots and Castings |
|---|---|---|
| 1913, per month | 855,000 | 639,000 |
| 1920, per month | 669,500 | 755,600 |
| 1921, per month | 217,600 | 302,100 |
| 1922, per month | 408,300 | 486,000 |
| 1923, per month | 619,800 | 707,400 |
| January, 1924 | 636,600 | 694,300 |
| February | 612,700 | 767,600 |
| March | 668,600 | 816,900 |
| April | 618,400 | 711,500 |
| May | 650,900 | 809,700 |
| June | 607,800 | 651,500 |
| July | 615,600 | 689,300 |
| August | 588,900 | 527,500 |
| September | 569,200 | 645,000 |
| October | 586,400 | 678,500 |
| November | 583,500 | 672,800 |
| December | 580,300 | 551,000 |

## Readjustment in Warehouse Prices on Welded Pipe in New York

After several months of confusion among dealers of wrought iron and steel pipe in New York, during which there were pronounced price variations in a given market, a new schedule of discounts has been adopted. This is a consequence of a long disrupted market in which the same product and delivery were sometimes available at prices representing a range of 10 points. During the brief period since announcing the new discounts, no price cutting has been seen. The readjustment is nominally downward from the previous quoted market and aims to allow a profit of from 6 to 7 per cent. The new discounts are published on page 262.

## Burden Iron Co. Blast Furnace Contracts

Julian Kennedy, Pittsburgh, has been retained as consulting engineer in the remodeling of the Burden Iron Co. blast furnace at Troy, N. Y., as recently taken over by the Hudson Valley Coke & Products Corporation. The contract for the steel for the new furnace shell, stoves, etc., has been let to the Riter-Conley Co., Pittsburgh.

The general supervision of the construction of the blast furnace as well as the by-product coke plant is in the hands of Leigh Willard, who is acting as manager and chief engineer of Hudson Valley Coke & Products Corporation.

The Northwestern Electric Co., Portland, Ore., plans the erection of a hydro-electric plant on the Lewis River, to cost $4,000,000.

## Action Against Steel & Tube Company Dismissed

Action started by the Allied Chemical & Dye Corporation to prevent the sale of the Steel & Tube Co. of America to the Youngstown Sheet & Tube Co. has been dismissed by the Delaware Court of Chancery. In earlier decisions the plaintiff received adverse verdicts. Action is still pending in the Federal Court at Chicago. In the 18 months during which the Youngstown Sheet & Tube Co. has operated the Chicago property, it has expended about $10,000,000 on improvements and contemplates further improvements. The Allied Chemical & Dye Corporation was a minority stockholder in the Steel & Tube company.

## Machine Tool Exhibition at Birmingham

A running exhibition of machine tools is being held in Birmingham, Ala., at the Young & Vann Supply Co.'s quarters and all makers in Alabama and adjoining states have been invited to send representatives. Among the concerns represented are: The American Tool Works Co., Barnes Drill Co., Brown & Sharpe Mfg. Co., Chisholm-Moore Mfg. Co., Cincinnati Electrical Tool Co., Cleveland Twist Drill Co., Colonial Steel Co., Jewell Belting Co., Kearney & Trecker Corporation, Norton Co., Skinner Chuck Co., Smith Inventions, Inc., Henry G. Thompson & Son Co., and the Warner & Swasey Co.

## Production of Refractory Brick in 1923

Both clay fire brick and silica brick showed large increase in production in 1923, compared with both 1922 and 1921, according to figures of the United States Census Bureau. The increase was recorded in both thousands of brick manufactured and in the value of the total product. In the case of fire brick the gain between 1921 and 1923 was 82 per cent in number and 87 per cent in value. With silica brick the gain was 146.1 per cent in number and 146.2 per cent in value.

In addition, the increase in the value of stove lining in the two years was 52.3 per cent, the increase in the value of other clay products, including gas retorts, flue lining, etc., was 69.5 per cent and the increase in magnesia or magnesite brick, carborundum, chrome and bauxite brick and in magnesia, chrome, carborundum, carbon, silica and alumina refractories other than brick, including refractory cement, was no less than 179.7 per cent. The principal figures for that portion of the brick and refractory production listed above are given in the table:

| | 1923 | 1922 | 1921 |
|---|---|---|---|
| Fire brick | $46,449,570 | $21,256,741 | $21,823,297 |
| Stove lining | 1,217,970 | 1,224,068 | 799,579 |
| Other clay products | 7,775,376 | 6,345,385 | 4,586,612 |
| Silica brick | 12,855,067 | 7,533,409 | 5,220,640 |
| Magnesite and other bricks and refractories | 7,085,019 | 6,552,219 | 2,523,209 |
| Total of above items | $75,383,002 | $53,011,822 | $34,973,337 |
| Thousands of brick produced: | | | |
| Fire brick | 1,129,971 | 836,724 | 621,009 |
| Silica brick | 258,388 | 186,547 | 104,990 |
| Average value per thousand: | | | |
| Fire brick | $41.11 | $37.48 | $39.99 |
| Silica brick | 49.75 | 40.38 | 49.73 |

## Moline Implement Co. Buys Plow Plant

The Moline Implement Co., a new corporation with 30,000 shares of no par common stock, has purchased from the Moline Plow Co., Moline, Ill., its plow factory and its entire assets and business pertaining to tillage implements and kindred lines. Control of the new company has been acquired by a group of the principal employees of the old organization. The Moline Implement Co. will start operations with assets of $3,000,000 and practically no debt. R. W. Lea is president and general manager; H. B. Dinneen, vice-president in charge of production; P. H. Noland, vice-president in charge of sales and Alvin Brown, secretary and treasurer.

# FABRICATED STEEL BUSINESS

## Awards and Inquiries Both in Notable Volume After November Rush

Though the large bookings of fabricated steel work in November are attributed in part to the pressure to take advantage of material prices about to be advanced, a sizable rate of awarding has been noteworthy since. Also the volume of new inquiry is encouraging. Awards, given below, account for over 29,000 tons, against 31,000 tons the week previous, and inquiries call for 34,500 tons as compared with 25,000 tons a week ago.

Academy of Medicine, New York, 1500 tons, to Taylor-Fichter Steel Construction Co.

Pennsylvania Railroad, bridge at Greensburg, Pa., and bridge in Ohio, each 200 tons, to American Bridge Co.

Philadelphia & Reading Railroad, bridge at Schuylkill Haven, Pa., 500 tons, to McClintic-Marshall Co.

Theater, New Orleans, 700 tons, to Harris Structural Steel Co.

Imperial Sugar Co., Sugarland, Tex., 900 tons, to Houston Structural Steel Co.

Electric power station in Alabama, 200 tons, to Congress Bridge & Steel Co.

Factory, Brooklyn, N. Y., 200 tons, to American Bridge Co.

New York Central Railroad, bridge repairs, 400 tons, to unnamed fabricator, and grade crossing elimination at Suspension Bridge, N. Y., 900 tons, to Shoemaker Bridge Co.

Baltimore & Ohio, bridge at East St. Louis, Mo., 200 tons, to McClintic-Marshall Co.

Office building, Long Island City, N. Y., 300 tons, to George A. Just Co.

Y. M. C. A., Flushing, N. Y., 500 tons, to Harris Structural Steel Co.

Peoples Trust Co., Brooklyn, N. Y., 400 tons, to National Bridge Co.

Sydenham Hospital, Manhattan Avenue and 123rd Street, New York, 1000 tons, to Hinkle Iron Works.

City of New York, building for Ninety-Second Street police precinct, 300 tons, to Communipaw Co.

Hotel, Thirty-Seventh Street and Lexington Avenue, New York, 1300 tons, to Taylor-Fichter Steel Construction Co.

Loft building, West Thirty-Fifth Street, New York, 1100 tons, to Harris Structural Steel Co.

Kenmore Hotel addition, Boston, 225 tons, to New England Structural Co.

Huntington National Bank, Columbus, Ohio, 1400 tons, to Case Crane & Engineering Co.

Knights of Columbus building, Columbus, Ohio, 550 tons, to Case Crane & Engineering Co.

Louisville & Nashville Railroad, Green River bridge, 1300 tons, to Mount Vernon Bridge Co.

Public Service Corporation, Harrison, N. J., gas holder, 600 tons, to Stacey Mfg. Co.

Shreveport Gas & Electric Co., Shreveport, La., power house, 1000 tons, to Worden-Allen Co.

City of Detroit, bascule bridge, 1500 tons, to Wisconsin Bridge & Iron Co.

Hibbard, Spencer, Bartlett & Co., office and warehouse, Chicago, 10,000 tons, to American Bridge Co.

Tower Theater, Chicago, 1500 tons, to A. Bolter's Sons Co.

Bliss & Laughlin Mfg. Co., Harvey, Ill., addition, 314 tons, to McClintic-Marshall Co.

Office building, Mason City, Iowa, 250 tons, to Pittsburgh Des Moines Steel Co.

Missouri Pacific Railroad, bridge at McArthur, Ark., 150 tons, to American Bridge Co.

Masonic Temple, Sixth Avenue and Jefferson Street, Gary, Ind., 126 tons, to unnamed fabricator.

Theater, Hyland Avenue and Hollywood Boulevard, Los Angeles, 500 tons, to Baker Iron Works.

Auto Touring Garage, Ocean Park, Los Angeles, 300 tons, to Baker Iron Works.

Cleveland City Garage, 170 tons, to Fort Pitt Bridge Works.

Otis Steel Co., Cleveland, runway for skull cracker, 140 tons, to McClintic-Marshall Co.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

Brooklyn Elevated Railroad, Brooklyn, N. Y., repairs, 300 tons.

City of New York, two sections of St. Nicholas Avenue subway, 5000 tons and 3300 tons each.

University of Maine, Orono, Me., memorial building, 600 tons.

Elks' Clubhouse, Boston, 3500 tons.

Champion Coated Paper Co., Hamilton, Ohio, 900 tons.

Waverley Sanitarium, Louisville, Ky., 450 tons, bids being taken.

U. S. Engineers' Office, Cincinnati, two towboats, 150 tons; Nashville Bridge Co. low bidder on complete boats, Howard Shipyards & Docks Co., low bidder on hulls.

Theater, Sheridan Road and Devon Avenue, Chicago, 950 tons, Levy & Klein, architects.

Inspiration Copper Co., plant in Montana, 1600 tons.

Transmission poles for export to Colombia, South America, 1500 tons.

City of St. Louis, water supply pipe line, 15,000 tons, bids opened Jan. 13.

Corn Products Refining Co., Pekin, Ill., 300 tons, bids taken this week.

Commercial Club, San Jose, Cal., 348 tons.

Pacific Telephone & Telegraph Co., Burlingame, Cal., 200 tons.

Port Angeles, Cal., pipe line, 500 tons, bids close Jan. 28.

Drummond-Miller Co., Cleveland, office building in Lorain, Ohio, 260 tons.

# RAILROAD EQUIPMENT BUYING

## Inquiries Appear for 8600 Cars, Not Including Passenger Equipment

**The railroad equipment market was featured by the appearance of inquiries for 8600 cars, with the New York Central among the roads, also some foreign railroads. The chief items are the following:**

The Pittsburgh Railroad is asking for 20 single end interurban motor cars, 65 double end one man motor cars and 15 single end one man motor cars.

The Norfolk & Western has awarded the rebuilding of 800 gondola cars to the Virginia Bridge & Iron Co. and the rebuilding of 783 gondolas to the Ralston Steel Car Co.

Swift & Co., Chicago, are in the market for 150 stock cars.

The Oklahoma City-Ada-Atoka is in the market for 50 all-steel and 50 single sheathed box cars.

The South African Railways are inquiring for 300 high-side 50-ton wagons.

The San Paulo Rio Grande, Brazil, is in the market for 30 flat and box cars.

The Chicago, Indianapolis & Louisville is in the market for 250 composite hopper cars.

The Oeste de Minas E. de F., Brazil, has purchased one 3-cylinder Pacific type locomotive from the Baldwin Locomotive Works.

The Canadian National Railways are in the market for four Mountain type locomotives and 500 automobile box cars.

The Belt Railway of Chicago has closed on five switching locomotives with the Baldwin Locomotive Works.

The Union Pacific has purchased one 3-cylinder 4-10-2 locomotive from the American Locomotive Co.

The Monon is inquiring for 250 hopper cars.

The Union Pacific is inquiring for 500 gondola and 500 flat cars, 15 coaches, 15 baggage cars, 5 dining cars and 5 observation cars.

The Seaboard Air Line is inquiring for 80 wooden caboose bodies and repairs on 1000 box cars.

The Cotton Belt and the St. Louis-San Francisco are both expected to enter the market for rolling stock.

The New York Central is in the market for 3000 box and 2000 gondola cars.

The General Refrigerator Line, Chicago, is inquiring for 1000 refrigerator cars.

The Union Railroad is inquiring for 20 caboose cars.

The Northern Pacific has placed 14 steel underframes for express refrigerator cars with the Siems Stembel Co.

The Missouri Pacific is inquiring for repairs on 250 wooden box and 2250 wooden gondola cars.

## Activity in Automobile Manufacture

**Activities are increasing in automobile producing plants following the New York show when evidence was given of a material improvement in buyer interest. Advanced schedules will be put into effect gradually until by the first of February the industry as a whole will be operating at a high level, although no effort will be made toward capacity operations, according to *Automotive Industries*, until actual demand warrants.**

## NON-FERROUS METALS

### The Week's Prices

Cents per Pound for Early Delivery

| | Copper, New York | | Straits Tin (Spot) | Lead | | Zinc | |
|---|---|---|---|---|---|---|---|
| Jan. | Lake | Electrolytic* | New York | New York | St. Louis | New York | St. Louis |
| 7..... | 15.25 | 14.87½ | 60.25 | 10.37½ | 10.10 | 8.17½ | 7.82½ |
| 8..... | 15.12½ | 14.75 | 59.50 | 10.50 | 10.25 | 8.15 | 7.80 |
| 9..... | 15.12½ | 14.75 | 59.50 | 10.50 | 10.25 | 8.20 | 7.85 |
| 10..... | 15.12½ | 14.75 | .... | 10.50 | 10.25 | 8.20 | 7.85 |
| 12..... | 15.25 | 14.87½ | 59.25 | 10.60 | 10.35 | 8.22½ | 7.87½ |
| 13..... | 15.25 | 14.87½ | 59.80 | 10.60 | 10.35 | 8.22½ | 7.87½ |

*Refinery quotation; delivered price ¼c. higher.

### New York

NEW YORK, Jan. 13.

Pronounced strength pervades all the markets, except possibly tin, which has declined from the high point of last week, due largely to lower values in London. The copper market is not active but prices are very firm. Conditions in lead are unchanged with quotations still higher. The zinc market is again strong and higher.

**Copper.**—Consumers are only moderately active in making inquiries for their needs which are apparently quite fully covered for the first quarter. Producers on the other hand are so well sold up that they are firm in their ideas of values and the minimum quotation today is 15.12½c., delivered, and it is stated that anything under this cannot be obtained. Some are even asking 15.25c., delivered. There is one inquiry in the market for 2000 net tons. There have been sales of substantial quantities to domestic consumers, but the export demand temporarily is exceedingly quiet. During the week, because of recessions in the London market, prices fell to the 15c. level but are now back again to where they were a week ago. Lake copper is selling at 15.25c., delivered.

**Tin.**—Sales in the week covered by this report totaled about 700 to 800 tons of Straits tin. Following the fairly large sales on Jan. 6 the market was dull the next day but about 400 tons changed hands on Jan. 8, the bulk of this going to independent tin plate producers. After another day of dullness on Jan. 9 about 100 to 150 tons changed hands on Jan. 10. Yesterday the market was fairly active with the total turnover close to 250 tons. In both cases consumers were the principal buyers with one large dealer a heavy seller. February-March deliveries were those most wanted with some requests for April and later deliveries. The market shows some signs of consumers being more fully covered for the first quarter. Speculative activity in London has resulted in lower prices there, the quotations today being £6 to £7 per ton less than a week ago, with spot standard quoted at £266 15s., future standard at £271 and spot Straits at £269 15s. The Singapore price yesterday was £277. Spot Straits tin at New York today was quoted at 59.75c. to 59.87½c. with a fair business done. Arrivals thus far this month have been 3480 tons, with 8390 reported afloat.

**Lead.**—Conditions in this market continue very difficult to interpret. The scarcity of the metal and the peculiar conditions surrounding transactions make representative quotations difficult. Values continue to advance, the leading interest having twice increased its contract price in the last week. On Jan. 8 it was moved up to 10.25c., and on Jan. 12 to 10.50c., New York. Quotations in the outside market also advanced with the minimum at St. Louis, 10.25c. and with quotations of other sellers still higher. Business has been done in the East at an equivalent of 10.60c., New York.

**Zinc.**—After a week of little change, the market yesterday started to advance largely because of some improvement in domestic demand, but more particularly from increased European demand, particularly Germany. Prime Western for early or 30-day delivery is quoted at 7.87½c. to 7.90c., St. Louis, or 8.22½c. to 8.25c., New York. These are higher than any prices during 1924.

**Nickel.**—Shot and ingot nickel in wholesale lots are quoted unchanged at 29c. to 30c. per lb., with electrolytic nickel at 33c.

**Antimony.**—The let-up in active demand has eased the situation slightly so that the Chinese brand is quoted today at 17.50c., New York, duty paid, for prompt and early delivery. Shipments from China are said to be again jeopardized by the military activities.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

**Old Metals.**—The market is strong, particularly white metals and demand is good. Dealers' selling prices are as follows in cents per lb.:

| | |
|---|---|
| Copper, heavy and crucible | 14.50 |
| Copper, heavy and wire | 13.50 |
| Copper, light and bottoms | 11.75 |
| Heavy machine composition | 11.00 |
| Brass, heavy | 9.50 |
| Brass, light | 8.00 |
| No. 1 red brass or composition turnings | 10.25 |
| No. 1 yellow rod brass turnings | 10.00 |
| Lead, heavy | 9.50 |
| Lead, tea | 8.25 |
| Zinc | 5.50 |
| Cast aluminum | 18.50 |
| Sheet aluminum | 18.50 |

### Chicago

JAN. 13.—Lead, zinc and antimony have advanced in a strong and more generally active market. There has been a heavy turnover in tin and prices have risen and fallen during the week, now being approximately the same as 7 days ago. Zinc is in good demand with prices largely dependent on the volume of foreign buying. Lead is now so high that consumer buying is restricted to imperative needs. Old metal prices are unchanged. We quote, in carload lots: Lake copper, 15.25c.; tin, 60.50c.; lead, 10.75c.; spelter, 7.95c.; in less than carload lots, antimony, 19c. On old metals we quote copper wire, crucible shapes and copper clips, 12.50c.; copper bottoms, 10.75c.; red brass, 9.75c.; yellow brass, 8.50c.; lead pipe, 8.75c.; zinc, 5c.; pewter, No. 1, 30c.; tin foil, 42c.; block tin, 50c.; all buying prices for less than carload lots.

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### New Interests to Expand the Republic Carbon Co.

The Aluminum Co. of America, the Carborundum Co. and associated interests announce the acquisition recently of a part interest in the Republic Carbon Co., the management of which they have taken over. Plans have been made to extend the plant and enlarge the scope of its operations. The Republic Carbon Co. was organized by the Uihlein interests of Milwaukee in 1920 for the manufacture of carbon electrodes. A new plant was built at Niagara Falls, N. Y., a description of which appeared in THE IRON AGE, Jan. 15, 1920. It has been in operation for the past four years supplying electrodes to electric steel foundries, ferroalloy manufacturers and to the electric furnace industry in general. The Uihlein interests still retain a large share in the company's capitalization.

The officers of the company are as follows: F. J. Tone, president; I. W. Wilson, vice-president; F. H. Manley, treasurer. The general offices, including the sales department of which R. L. Baldwin is sales manager, have been moved to Niagara Falls.

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### Atlas Steel Corporation Sold

Frank R. Collins, vice-president Buffalo Trust Co., acting for the reorganization committee of the creditors of the Atlas Steel Corporation, Dunkirk, N. Y., has purchased the company for $250,000 from the receiver, John Lord O'Brian of Buffalo. The consideration was subject to nearly $2,000,000 in mortgages and $577,000 in other secured securities. In addition to these liens there are $3,200,000 due unsecured creditors.

Creditors plan to reorganize the bankrupt company into the new Atlas Alloy Steel Corporation, providing the sale is approved by Federal Judge Hazel. The plan is to issue stock to the creditors and turn over the company to another organization to operate.

# Prices of Finished Iron and Steel Products (Carload Lots)

### Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....2c. to 2.10c.
F.o.b. Chicago, base, per lb.....2.20c.

### Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.10c.
F.o.b. Chicago, base, per lb.....2.20c.

### Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....2.10c.
Soft steel bars f.o.b Chicago, base, per lb.....2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb....2.10c.
Rails steel bars f.o.b. Chicago district mills, base, per lb...2c.
Common iron bars f.o.b. Chicago, base, per lb.....2c.
Refined iron bars f.o.b. P'gh mills, base, per lb..2.90c. to 3.00c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

### Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....2.50c.
Bands, base, per lb.....2.40c. to 2.50c.
Hoops and bands, narrower than 1-in., base per lb.....2.75c.
Strips, 10 in. and wider, base, per lb.....2.25c. to 2.35c.
Strips, less than 10 in. wide to 3 in.....2.40c. to 2.50c.
Strips, 3 in. wide and less, base, per lb.....2.50c. to 2.60c.

### Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb..2.80c.
Screw stock and shafting, f.o.b. Chicago, base, per lb..2.80c.
Screw stock, Worcester mills, base, per lb.....3.00c.
Screw stock, base, per lb., Cleveland.....2.85c.
Shafting, ground, f.o.b. mill, base, per lb.....3.20c.
Strips, f.o.b. P'gh mills, base, per lb.....4.00c. to 4.15c.
Strips, f.o.b. Cleveland mills, base, per lb.....4.15c.
Strips, f.o.b. Chicago mills, base, per lb.....4.45c.
Strips, f.o.b. Worcester mills, base, per lb.....4.30c.

### Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg..... $2.85
Galvanized nails, 1-in. and longer, base plus..... 2.25
Galvanized nails, shorter than 1-in., base plus..... 2.50
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.60
Annealed fence wire, base, per 100 lb..... 2.75
Galvanized wire No. 9, base, per 100 lb..... 3.20
Galvanized barbed, base, per 100 lb..... 3.55
Galvanized staples, base, per keg..... 3.55
Painted barbed wire, base, per 100 lb..... 3.30
Polished staples, base, per keg..... 3.30
Cement coated nails, base, per count keg..... 2.25
•Bale ties, carloads to jobbers....75, 15 and 5 per cent off list
•Bale ties, carloads to retailers....75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....67.00

Chicago district mill prices are $2 per ton above the foregoing and Chicago delivered prices are $3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices $3 a ton higher; Worcester, Mass., mills $3 a ton higher on production of that plant, and Duluth, Minn., mills $2 a ton higher; Anderson, Ind., $1 higher.

•F.o.b. Cleveland.

### Sheets

*Blue Annealed*
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mill.....2.70c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills..2.80c.

*Box Annealed, One Pass Cold Rolled*

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.70c.

*Galvanized*

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....4.75c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....4.85c.

*Tin-Mill Black Plate*

No. 28 (base) per lb., f.o.b. Pittsburgh dist mill.....3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.70c.

*Automobile Body Sheets*

No. 22 (base) per lb., f.o.b. mill.....4.75c.

*Long Ternes*

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

### Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district mills.....$5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

### Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

| | | | |
|---|---|---|---|
| 8-lb. coating, 100 lb. base | $11.20 | 20-lb. coating I. C. | $15.50 |
| 8-lb. coating I. C. | 11.50 | 25-lb. coating I. C. | 17.00 |
| 15-lb. Coating I. C. | 14.35 | 30-lb. coating I. C. | 18.35 |
| | | 40-lb. coating I. C. | 20.35 |

### Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb..$2.60
Large, f.o.b. Chicago, base, per 100 lb..... 2.75
Small, f.o.b. P'gh and Cleveland mills
70, 10 and 5 per cent off list
Small (freight allowed within zone limits).....70 off list

### Rails and Track Equipment

(F.o.b. mill)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.
Spikes, ⅜ in. and larger, base, per 100 lb.....$2.90 to $3.20
Spikes, ½ in. and smaller, base, per 100 lb..... 3.00 to 3.50
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.80 to 4.25
Tie plates, per 100 lb..... 2.35 to 2.50
Angle bars, base, per 100 lb..... 2.75

### Welded Pipe

(F.o.b. Pittsburgh district mills)

*Butt Weld*

| Steel Inches | Black | Galv. | Iron Inches | Black | Galv. |
|---|---|---|---|---|---|
| ⅛ | 45 | 19½ | ¼ to ⅜ | +11 | +39 |
| ¼ to ⅜ | 51 | 25½ | ½ | 22 | 2 |
| ½ | 56 | 42½ | ¾ | 28 | 11 |
| ¾ | 60 | 48½ | 1 to 1½ | 30 | 13 |
| 1 to 3 | 62 | 50½ | | | |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 55 | 43½ | 2 | 23 | 7 |
| 2½ to 6 | 59 | 47½ | 2½ | 26 | 11 |
| 7 and 8 | 56 | 43½ | 3 to 6 | 28 | 13 |
| 9 and 10 | 54 | 41½ | 7 to 12 | 26 | 11 |
| 11 and 12 | 53 | 40½ | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | 41 | 24½ | 2 to 3 | 61 | 50½ |
| ¼ to ⅜ | 47 | 30½ | ¼ to ⅜ | +11 | +54 |
| ½ | 53 | 42½ | ½ | 21 | 7 |
| ¾ | 58 | 47½ | ¾ | 28 | 12 |
| 1 to 1½ | 60 | 49½ | 1 to 1½ | 30 | 14 |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 53 | 42 | 2 | 23 | 9 |
| 2½ to 4 | 57 | 46½ | 2½ to 4 | 29 | 15 |
| 4½ to 6 | 56 | 45½ | 4½ to 6 | 28 | 14 |
| 7 to 8 | 52 | 39½ | 7 to 8 | 21 | 7 |
| 9 and 10 | 45 | 32½ | 9 to 12 | 16 | 2 |
| 11 and 12 | 44 | 31½ | | | |

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ points, with supplementary discount of 5 per cent.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2½ points less.

### Boiler Tubes

(F.o.b. Pittsburgh)

| *Lap Welded Steel* | | *Charcoal Iron* | |
|---|---|---|---|
| 2 to 2¼ in. | 27 | 1½ in. | +18 |
| 2½ to 2¾ in. | 37 | 1¾ to 1⅞ in. | + 8 |
| 3 in. | 40 | 2 to 2¼ in. | — 2 |
| 3¼ to 3¾ in. | 42½ | 2½ to 3 in. | — 7 |
| 4 to 13 in. | 46 | 3¼ to 4½ in. | — 9 |

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

*Standard Commercial Seamless Boiler Tubes*
*Cold Drawn*

| | | | |
|---|---|---|---|
| 1 in. | 55-58 | 3 and 3¼ in. | 36-39 |
| 1¼ and 1½ in. | 47-50 | 3½ and 3¾ in. | 37-40 |
| 1¾ in. | 31-34 | 4 in. | 41-44 |
| 2 and 2¼ in. | 22-25 | 4½ in. and 5 in. | 33-37 |
| 2½ to 2¾ in. | 32-35 | | |

*Hot Rolled*

| | | | |
|---|---|---|---|
| 3 and 3¼ in. | 38-41 | 4 in. | 43-46 |
| 3½ in. and 3¾ in. | 39-42 | | |

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

*Seamless Mechanical Tubing*

Carbon under 0.30 base.....85 to 87 per cent off list
Carbon 0.30 to 0.40 base.....83 to 85 per cent off list
Plus usual differentials and extra for cutting. Warehouse discounts range higher.

*Seamless Locomotive and Superheater Tubes*

| | Cents per Ft. | | Cents per Ft. |
|---|---|---|---|
| 2-in. O.D. 12 gage | 15 | 2¼-in. O.D. 10 gage | 20 |
| 2-in. O.D. 11 gage | 16 | 3-in. O.D. 7 gage | 35 |
| 2-in. O.D. 10 gage | 17 | 1½-in. O.D. 9 gage | 15 |
| 2¼-in. O.D. 12 gage | 17 | 5¾-in. O.D. 9 gage | 55 |
| 2¼-in. O.D. 11 gage | 18 | 5½-in. O.D. 9 gage | 57 |

# Prices of Iron and Steel Products and Raw Materials

## Ores

*Lake Superior Ores, Delivered Lower Lake Ports*

| | |
|---|---|
| Old range Bessemer, 55 per cent iron | $5.65 |
| Old range non-Bessemer, 51½ per cent iron | 4.90 |
| Mesabi Bessemer, 55 per cent iron | 5.40 |
| Mesabi non-Bessemer, 51½ per cent iron | 4.75 |
| *Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore* | |
| Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian | 9.00c. to 9.50c. |
| Iron ore, Swedish, average 66 per cent iron | 9.50c. |
| Manganese ore, washed, 51 per cent manganese, from the Caucusus, nominal | 42c. |
| Manganese ore, ordinary, 48 per cent manganese from the Caucasus | 40c. |
| Manganese ore, Brazilian or Indian, nominal | 42c. |
| Tungsten ore, high grade, per unit, in 60 per cent concentrates | $8.75 to $9.00 |
| Chrome ore, basic, 48 per cent $Cr_2O_3$, crude, per ton, c.i.f., Atlantic seaboard | 18.50 to 24.00 |
| Molybdenum ore, 85 per cent concentrates, per lb. of $MoS_2$, New York | 80c. |

## Coke and Coal

(Per Net Ton)

| | |
|---|---|
| Furnace coke, f.o.b. Connellsville prompt | $4.00 to $4.25 |
| Foundry coke, f.o.b. Connellsville prompt | 5.00 to 6.00 |
| Mine run steam coal, f.o.b. W. Pa. mines | 1.50 to 2.10 |
| Mine run coking coal, f.o.b. W. Pa. mines | 2.00 to 2.10 |
| Mine run gas coal, f.o.b. W. Pa. mines | 2.25 |
| Steam slack, f.o.b. W. Pa. mines | 1.40 to 1.50 |
| Gas slack, f.o.b. W. Pa. mines | 1.50 to 1.60 |

## Ferroalloys

| | |
|---|---|
| Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton | $110.00 to $115.00 |
| Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid | 110.00 |
| Ferrosilicon, 50 per cent, delivered | 82.50 to 85.00 |
| Ferrosilicon, 75 per cent | 145.00 to 147.50 |
| Ferrotungsten, per lb. contained metal | 90c. to 95c. |
| Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered | 11.50c |
| Ferrovanadium, per lb. contained vanadium | $3.50 to $4.00 |
| Ferrocarbontitanium, 15 to 18 per cent, per net ton | 200.00 |

## Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 t 21 per cent.....$33.00 to $35.00
Spiegeleisen, domestic, 16 to 19 per cent..... 32.00 to 34.00
Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42; 12 per cent, $44.50; electric furnace ferrosilicon 10 to 11 per cent, $38, furnace, with an advance of $1 per unit for material above 10 per cent.
Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

## Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines .....$19.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucgy mines ..... 20.00
Fluorspar, foreign, 85 per cent calcium, fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton ..... 18.00

Per 1000 f.o.b. works:

| | High Duty | Moderate Duty |
|---|---|---|
| Fire Clay: | | |
| Pennsylvania | $43.00 to $46.00 | $40.00 to $43.00 |
| Maryland | 48.00 to 50.00 | 43.00 to 45.00 |
| Ohio | 43.00 to 46.00 | 40.00 to 43.00 |
| Kentucky | 43.00 to 45.00 | 40.00 to 43.00 |
| Illinois | 43.00 to 45.00 | 40.00 to 43.00 |
| Missouri | 45.00 to 48.00 | 38.00 to 43.00 |
| Ground fire clay, per ton | | 6.50 to 7.50 |
| Silica Brick: | | |
| Pennsylvania | | 40.00 |
| Chicago | | 49.00 |
| Birmingham | | 54.00 |
| Silica clay, per ton | | 8.00 to 9.00 |
| Magnesite Brick: | | |
| Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.) | | 65.00 |
| Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.) | | 40.00 |
| Chrome Brick: | | |
| Standard size, per net ton | | 45.00 |

## Bolts and Nuts

Machine bolts, small rolled threads...60 and 10 per cent off list
Machine bolts, all sizes, cut threads
50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads
50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes..50 and 10 per cent off list
Eagle carriage bolts.....65 and 10 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads .....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ x 4 in.
45, 10 and 5 per cent off list
Larger and longer sizes.....45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square.....4c. off list
Hot-pressed nuts, blank or tapped, hexagons....4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.4.10c. off list
Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S.....80, 10 and 5 per cent off list
⅞ in. and larger, U. S. S.....75, 10 and 5 per cent off list
Small sizes, S. A. E.....80, 10, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger....75, 10, 10 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80 and 5 and 2½ per cent off list
Tire bolts .....50, 10 and 5 per cent off list
Bolt ends with hot pressed nuts..50, 10 and10 per cent off list
Bolt ends with cold pressed nuts...45, 10 and 5 per cent off list
Washers .....6c. to 5.50c. off list

The foregoing are delivered prices for 1000 lb. or over, except on stove and tire bolts on which a full freight allowance is made on 300 lb. or over, for shipment within established zone limits, buyers outside of the zone paying the additional freight. Washers and lock washers are quoted f.o.b. Chicago and Pittsburgh.

## Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)
(To jobbers and consumers in large quantities)

| | Per 100 Net S. A. E. | Per 100 Net U. S. S. | | Per 100 Net S. A. E. | Per 100 Net U. S. S. |
|---|---|---|---|---|---|
| ½-in. | $0.44 | $0.44 | ⅞-in. | $2.35 | $2.40 |
| 9/16-in. | .515 | .515 | 1-in. | 3.60 | 3.60 |
| ⅝-in. | .62 | .66 | 1 in. | 5.55 | 5.80 |
| 11/16-in. | .79 | .90 | 1⅛ in. | 8.90 | 8.90 |
| ¾-in. | 1.01 | 1.05 | 1¼ in. | 12.60 | 13.10 |
| 13/16-in. | 1.38 | 1.42 | 1⅜ in. | 18.35 | 18.35 |
| ⅞-in. | 1.70 | 1.73 | 1½ in. | 21.00 | 21.00 |

Larger sizes—Prices on application.

## Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws....80, 10 and 10 to 80 and 10 per cent off list
Milled standard set screws, case hardened
80, 10 and 10 to 80 and 10 per cent off list
Milled headless set screws, cut thread
80, 10 and 10 to 80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread
80, 10, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread
80, 10, 10 and 10 per cent off list
Milled studs .....75 and 10 to 75 per cent off list

## Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, Bessemer, 4-in. and over.....$37.00 to $38.00
Rolling billets, open-hearth, 4-in. and over..... 38.00 to 38.50
Forging billets, ordinary carbons..... 42.50
Sheet bars, Bessemer ..... 38.00 to 40.00
Sheet bars, open-hearth ..... 39.00 to 40.00
Slabs ..... 37.00 to 38.00
*Wire rods, common soft, base, No. 5 to ⅝-in. 48.00
Wire rods, common soft, coarser than ⅝-in....$2.50 over base
Wire rods, screw stock.....$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40..... 3.00 per ton over base
Wire rods, carbon 0.41 to 0.55..... 5.00 per ton over base
Wire rods, carbon 0.56 to 0.75..... 7.50 per ton over base
Wire rods, carbon over 0.75.....10.00 per ton over base
Wire rods, acid.....15.00 per ton over base
Skelp, grooved, per lb.....2c.
Skelp, sheared, per lb.....2c.
Skelp, universal, per lb.....2c.

*Chicago mill base is $50. Cleveland mill base, $48.

## Alloy Steel

(F.o.b. Pittsburgh or mill)

| S. A. E. Series Numbers | Bars 100 lb. |
|---|---|
| 2100*(1½% Nickel, 10 to 20 per cent Carbon) | $3.00 to $3.25 |
| 2300 (3½% Nickel) | 4.75 |
| 2500 (5% Nickel) | 6.25 to 6.50 |
| 3100 (Nickel Chromium) | 3.65 |
| 3200 (Nickel Chromium) | 5.50 |
| 3300 (Nickel Chromium) | 7.50 to 7.75 |
| 3400 (Nickel Chromium) | 6.50 to 6.75 |
| 5100 (Chromium Steel) | 3.50 |
| 5200*(Chromium Steel) | 7.50 to 8.00 |
| 6100 (Chromium Vanadium bars) | 4.25 |
| 6100 (Chromium Vanadium spring steel) | 4.25 |
| 9250 (Silicon Manganese spring steel) | 3.50 |
| Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium) | 4c. |
| Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium) | 4.50 |
| Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum) | 4.25 |
| Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum) | 3.75 |
| Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum) | 4.75 to 5.00 |

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

## PERSONAL

The vacancy created by the death of William Whigham, vice-president in charge of operations, Carnegie Steel Co., has been filled by the election of Ambrose N. Diehl and I. Lamont Hughes as vice-presidents in charge of operation. Mr. Diehl, who has been general superintendent of the Duquesne works of the company, will be located at the general offices in Pittsburgh and will have supervision of the Pittsburgh district plants, which include the Homestead, Pa., works, Edgar Thomson works, Braddock, Pa., Duquesne, Pa., and Clairton, Pa., works, and the several rolling mills and blast furnaces in Pittsburgh, known as the city furnaces and city mills. Mr. Hughes, who has been general superintendent of the Youngstown district plants, will make his headquarters in Youngstown and will have charge of all Valley plants, which include those at New Castle and Farrell, Pa.; Youngstown, Mingo, Bellaire and Columbus, Ohio. Samuel G. Worton, assistant general superintendent Duquesne works, has been appointed to succeed Mr. Diehl as general superintendent at that plant and David C. Burroughs succeeds to Mr. Worton's former position. Appointment of a successor to Mr. Hughes as Youngstown district general superintendent has not yet been made.

A. N. DIEHL

I. L. HUGHES

S. G. WORTON

ROLAND GERRY

Ambrose N. Diehl was born in York County, Pa., Oct. 20, 1876. His ancestors settled in eastern Pennsylvania and Delaware 225 years ago. He received his early education in the York public schools and was graduated from Pennsylvania State College with a bachelor of science degree in 1898. He is a member of the Sigma Chi fraternity. After graduation he spent one year in experimental agriculture in the Pennsylvania experimental station, and in 1899 took a position in the laboratories of the Carnegie Steel Co. at its Duquesne works. After several months he was transferred to the blast furnace department of the same plant and six months later was made assistant blast furnace superintendent. In October, 1901, he was given charge of the department and remained in this capacity until 1915, when he became assistant general superintendent of the Duquesne steel works and blast furnaces. After being in that position for a year and a half he served as assistant operating vice-president in the general offices in Pittsburgh for a similar period, when the stress of the war work placed unusual strain on that executive department. In 1918 he was appointed general superintendent of the Duquesne works. Mr. Diehl has read a number of technical papers before the American Iron and Steel Institute; the American Institute of Mining and Metallurgical Engineers and the Engineers Society of Western Pensylvania. He has served as a director of both the latter organizations. In addition to membership in those bodies and various clubs, he is a member of the American Society of Mechanical Engineers; president of the University Club of Pittsburgh, and a trustee of Pensylvania State College.

Mr. Hughes has been with the Carnegie Steel Co. or its allied interests for more than 25 years. He was born in Mercer, Pa., Jan. 25, 1878. He was educated in the public schools of Mercer and New Castle, Pa., and later was graduated from the high school of North Braddock, Pa. Upon his graduation he took up his work in the steel industry, his first position being in the engineering department of the Edgar Thomson Works, Carnegie Steel Co., in September, 1897. He remained there until June, 1901, when he took charge of engineering for the Union Steel Co., Donora, Pa., and in January, 1905, went to Youngstown, Ohio, as master mechanic of the Youngstown district bar mills of the Carnegie Steel Co., the district at the time including mills at Warren and Girard, Ohio; Greenville, Pa., and the Upper and Lower Union Mills at Youngstown. Mr. Hughes was made assistant general superintendent of the bar mills of the Youngstown district in March, 1906, and exactly five years later he was made general superintendent of these mills. He continued in this capacity until Jan. 1, 1916, when he was made assistant general superintendent of the entire Youngstown district of the Carnegie Steel Co., whose operations at that time included the construction of the modern steel bar mills and a town site at McDonald, Ohio. In June, 1916, Mr. Hughes went to Ojibway, Ontario, as general superintendent in charge of the Canadian Steel Co. project at that place. Contemplated operations here were necessarily deferred by the war, and Mr. Hughes was transferred in June, 1918, to be general superintendent of the operations being carried on at Neville Island, Pittsburgh, by the United States Steel Corporation for the Government in the construction of a projected ordnance plant. When this project was suspended because of the ending of the war, Mr. Hughes was made president of the Lorain Steel Co. at Johnstown, Pa., taking up these duties May 1, 1919, and on Jan. 1, 1920, he was made general superintendent of all the operations of the Carnegie Steel Co. in the Youngstown district.

S. G. Worton, new general superintendent, Duquesne works, has been with the Carnegie Steel Co. since 1889, when he entered the employ of the company as a laborer in its Homestead works. Later he became a melter and a melting foreman. In 1904 he went to the Donora, Pa., plant of the American Steel & Wire Co. as superintendent of the open-hearth department. In 1908 he was transferred to the Duquesne works, Carnegie Steel Co., as superintendent of open-hearth furnaces, and in 1917 he was promoted to the position of assistant general superintendent. D. C. Burroughs, the new assistant general superintendent, for the past

nine years has been in charge of the electric furnace and alloy steel department at Duquesne works.

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Roland Gerry and Robert Geddis, long associated with the Jones & Laughlin Steel Corporation, have announced their retirement from active connection with the company and with the steel industry. Mr. Gerry has been associated with the Jones & Laughlin organization 44 years and until Feb. 1, 1922, was manager of sales, cold-rolled department, having general supervision of sales of cold-finished steel bars and also of railroad track accessories. He was a director of the corporation until Jan. 1, when he resigned. Mr. Geddis has been with the company 30 years and until about a year ago, when he became general manager of sales of the Western district, including the territory west of Denver, he had been manager of sales in the hot-rolled department. He was also a director of the company. Both men had a wide acquaintance with the consumers of steel products throughout the country and will be missed from the spheres of business activity.

Eugene C. Peck has retired as works manager of the Cleveland Twist Drill Co., Cleveland, with which he has been associated 25 years. His duties have been assumed by J. B. Dillard, who has been superintendent but now has the title of general superintendent. Mr. Dillard has been with the company five years, is a West Point graduate and had the rank of colonel when he left army service. Mr. Peck was chief of the gage section in the engineering division of the Ordnance Department during the war and was army representative on the National Screw Trade Commission, of which he is still a member. He is also a chairman of the standardization committee of the American Society of Mechanical Engineers and chairman of the committee on plain limit gages.

O. P. Hanchette, welding engineer, has joined the sales force at the Cleveland office of the Burke Electric Co., Erie, Pa., maker of direct and alternating current machinery. He will specialize in the sale of electric arc welding equipment.

Donald M. Watkins, until recently superintendent of the blooming mills, South Side works, Jones & Laughlin Steel Corporation, Pittsburgh, and previously for several years engineering editor of *Blast Furnace and Steel Plant*, has joined the sales department of the General Refractories Co. in its Chicago office.

William J. Eberlien has been appointed district manager of the Williams Tool Corporation at the Chicago office, 549 West Washington Boulevard. Mr. Eberlien was associated with the Greenfield Tap & Die Corporation at the factories in Greenfield, Mass., later being appointed store manager of their Chicago branch. He will take up his new duties after spending a time at the factories in Erie, Pa.

Oscar W. Loew will assume charge of advertising and sales promotion for the Truscon Steel Co., Youngstown, Ohio, effective Feb. 1.

M. C. Bias, purchasing agent of the Mitchell Motor Co., Racine, Wis., for many years, and previous to that connected with the International Harvester Co., Chicago, has been elected secretary-treasurer of the Steel Products Mfg. Co., Racine, manufacturer of gasoline engine valves.

A. C. Roeth, sales department, Inland Steel Co., Chicago, has been promoted to assistant vice-president of that department.

Malcolm E. Gregg, formerly district sales manager of the Republic Iron & Steel Co. at Cincinnati and prior to that district sales agent for the Lackawanna Steel Co. at Buffalo and at Detroit, has joined the sales force of the Inland Steel Co. at St. Paul, Minn., under B. C. Bradford, district sales manager. Mr. Gregg has been out of the steel business for a few years, his most recent connection having been with the Stromberg Motor Devices Co. as district sales manager at Buffalo.

W. P. Kirk, district manager of sales of the Niles-Bement-Pond Co. at Cincinnati, has been transferred to the New York office, effective Jan. 15. He is widely known in the Middle West, having traveled the territory several years. He was presented with a traveling bag previous to his departure, by the Metal Trades' Table of the Cincinnati Business Men's Club, of which he has been a member for many years. His place at Cincinnati will be taken by E. H. Gates, formerly of the company's Rochester, N. Y., office.

Gordon S. Rentschler, president, Hooven-Owens-Rentschler Co., Hamilton, Ohio, manufacturer of engines, has been appointed vice-president and assistant to the president of the National City Bank, New York. Mr. Rentschler has been a director of the bank for a year and is the youngest member of the board. Though his duties will necessitate spending most of his time in New York, Mr. Rentschler will maintain his residence in Hamilton, and also the presidency of the Hooven-Owens-Rentschler Co.

E. P. Hettiger, who recently retired from the firm of Hickman, Williams & Co., as Cincinnati partner, has been elected president and sales manager of the Kentucky Fluorspar Co., with mines and offices at Marion, Ky. He has established headquarters at Room 1211, First National Bank Building, Cincinnati.

Morton R. Hunter, president Hunter Machinery Co., Milwaukee, was elected president of the Associated Equipment Distributors of America at the fifth annual convention in Milwaukee, Jan. 2-5. William H. Ziegler, Minneapolis, and A. C. Blaisdell, Cincinnati, were elected vice-presidents, and William Louer, Chicago, treasurer. The association consists of manufacturers' exclusive sales representatives in the contractors' and general equipment field, and its members' aggregate sales in 1924 were reported at approximately $225,000,000.

James F. Hamilton, who was connected with the works of the Worthington Corporation at Cudahy, suburb of Milwaukee, for ten years, has been appointed to take charge of a general sales office established in Milwaukee at 895 South Pierce Street. When the Cudahy plant was liquidated last July he was transferred to the Harrison, N. J., works, returning to Milwaukee on Jan. 1 to take charge of territorial sales.

S. T. Thompson, secretary and general manager Duplex Engine Governor Co., has been elected vice-president of the Duplex Condenser & Radio Corporatin, with factory in the Sperry Building, Brooklyn. In his new capacity he will have complete charge of factory operations.

Edward T. Moore has opened an office at 500 Cahill Building, Syracuse, N. Y., for the general practice of consulting engineering and the manufacture of the Moore electric power regulator. He will specialize in industrial plant problems and in electric furnace installations with which his regulator is closely allied. Mr. Moore was formerly chief engineer of the Halcomb Steel Co. at Syracuse and consulting engineer for the Crucible Steel Co. of America.

C. D. Steenburgh, formerly purchasing agent for the North East Electric Co., Rochester, N. Y., has joined the Precise Mfg. Corporation, 254 Mill Street, Rochester, radio equipment manufacturer, to take charge of purchasing.

D. M. Howell, who has been with the New York Scrap Iron & Steel Co., New York, for the past two years, recently severed his connection with that company and now is associated with the Debevoise-Anderson Co. in the scrap iron department at headquarters in New York.

Frank N. Sutter has resigned as assistant sales manager of the Morse Rogers Steel Co., Cleveland, to take charge of the alloy steel sales of the Bethlehem Steel Co. in the Cleveland district.

William Ruddy has returned after 18 months in Paris, France, where he has been engaged in the remodeling and introduction of American methods in the foundry of André Citroën, the largest producer of automobiles in Europe.

C. R. Lowrie, after having been with the Kilbourne & Jacobs Mfg. Co. and its successor, the Case Crane &

Engineering Co., at Columbus, Ohio, for 17 years, has left the organization. K. B. Norton, a son of the president of the company, has assumed his duties. Mr. Lowrie started with the company immediately after graduating from Ohio State University in 1907, and worked through all productive departments, including four years as general purchasing agent and ending with four years as general superintendent in charge of operations. He has made no definite plans for the future.

George B. Thorp has been appointed assistant manager of the sheet mill department, Weirton Steel Co., Weirton, W. Va. He has been with this company for several years and prior to going into the operating department about two years ago, was in the raw materials department.

W. M. Corse is vice-president and general manager of the Research Service in Washington, which offers engineering service of a research nature to organizations that find advantage in having a Washington connection to make contacts with Government officials and carry on investigations through the various Government bureaus.

Charles H. Logue has resigned as consulting engineer for the Brown-Lipe-Chapin division of the General Motors Corporation to open an office as consulting engineer, specializing on gears.

C. Moody, formerly manager of the Auto Lite Gas Company, Ltd., Winnipeg, Canada, has joined the apparatus factory organization of the Purox Co., at Los Angeles, Cal., as assistant manager.

Prof. Gar A. Roush, associate professor of metallurgy at Lehigh University, has been commissioned major in the Officers Reserve Corps, his acceptance having been prompted by the request of the Assistant Secretary of War. Professor Roush will serve as special lecturer on strategic minerals at the Army Industrial College in Washington, and will devote a week, twice each year, to this work.

H. E. Byer is located in Chicago as manager of condenser and vacuum pump sales for the Chicago Pneumatic Tool Co.

Francis C. Pratt, vice-president in charge of engineering, General Electric Co., has been appointed to fill the vacancy caused by the resignation of G. E. Emmons and is now vice-president in charge of engineering and manufacturing.

Frank D. Chase, president Frank D. Chase, Inc., Chicago, was scheduled to address a meeting at the La Salle Hotel, Jan. 14, of the American Society of Mechanical Engineers on "Modern Industrial Plant and Its Power."

William H. Utz, vice-president and formerly European director of Jenkins Brothers, Limited, manufacturers of valves, with headquarters at London, England, has been made director of sales.

Frank Purnell, vice-president in charge of sales of the Youngstown Sheet & Tube Co., has an excellent article in the company's *Bulletin* showing how employees can help in improving the quality of steel products. Customers' complaints as to defective material, he writes, could be almost entirely eliminated if the workmen would do their part.

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The Western Central Association of Stove Manufacturers, at its annual meeting in the Congress Hotel, Chicago, recently, elected the following officers for the coming year: President, A. D. Sperry, vice-president Rock Island Stove Co., Rock Island, Ill.; vice-president, George W. Page, Home Stove & Foundry Co., Chicago; treasurer, John A. Underwood, Favorite Stove Works, Piqua, Ohio.

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The December payroll at Youngstown of $6,696,297, announced this week, is a gain of $500,000 over the December distribution and indicates the improvement in operations of iron and steel properties. It brings the year's total payroll to $76,598,190.

## OBITUARY

JAMES A. BRETT, district manager at Cincinnati of the Westinghouse Electric & Mfg. Co., died Jan. 7 at Hamilton, Bermuda, where he had gone on a holiday trip. Mr. Brett was born in Mount Vernon, N. Y., in 1864, and when 20 years old became associated with Charles Sprague, later known as "the father of the trolley car." While in the employ of Mr. Sprague, Mr. Brett installed many trolley car systems throughout the country and upon Mr. Sprague's death became affiliated with the Westinghouse company. He had been district manager at Cincinnati since 1905. He is survived by his wife and two sons.

CHARLES M. STRUCK, superintendent of the Struck Construction Co., Louisville, Ky., was killed on Jan. 5 by a fall from a power house which his company was erecting. He was 38 years old, a son of the late Alfred Struck, and previous to his present position was with the Louisville Gas & Electric Co. as civil engineer.

CLYDE O. SHERWOOD, sales manager of the Ross-Willoughby Co., dealer in contractors' and mill supplies, Columbus, Ohio, died on Jan. 9, aged 46 years.

WILLIAM J. STEWART, assistant superintendent By-Products Coke Corporation, South Chicago, Ill., died Jan. 2 at the age of 43, following a year's illness. Mr. Stewart was born in Sarnia, Canada, and became associated with the By-Products corporation at the time its coke ovens were built in 1905.

MICHAEL RUPRECHT, aged 56 years, president Union City Wheel Co., Union City, Ind., died Jan. 3 from an acute heart attack. Together with his brother he founded the Union City Wheel Co. 20 years ago.

WILLIAM S. ESTELL, secretary Adams & Westlake Co., manufacturer of railroad supplies, Chicago, died of pneumonia in that city on Jan. 4 at the age of 67.

DENNIS F. EGAN, eastern representative for Henry E. Pridmore, Chicago, manufacturer of molding machines, died at his home in Lynn, Mass., Dec. 31. He had represented the Pridmore company for over 30 years in New England, New York and Pennsylvania. He entered the foundry industry in New England as a molder when a young man.

HORACE SMYTHE, president and one of the founders of the S. R. Smythe Co., Pittsburgh, Pa., died at his home in that city, Jan. 9. Mr. Smythe was born in Dover, England, Dec. 12, 1864, and was a graduate of Oxford University. In 1887, in association with his brother, S. R. Smythe, he organized the S. R. Smythe Co. to engage in engineering. He was prominent for a great many years in the steel industry in the field of furnace construction and combustion engineering and had devised and patented many improvements in furnace construction and fuel applications.

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More quicksilver (mercury) was produced in the United States in 1924 than in 1923, according to estimates of the Geological Survey, which place the 1924 total at 9600 flasks of 75 lb. net each, compared with 7937 flasks in 1923. California in 1924 was responsible for 7890 flasks, or more than 80 per cent of the total, while the remaining 1710 flasks came from Texas, Nevada, Oregon, Idaho and Alaska. The average price per flask during the year is given as $69.51 in New York and $68.69 in San Francisco. The price at the end of the year was considerably higher, being $74 in New York and $72.65 in San Francisco.

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Bituminous coal production in Pennsylvania in 1924 is estimated at 122,000,000 tons by the State Department of Mines, based on estimated figures reported by 28 of the 30 districts in Pennsylvania. The 1923 actual production was 169,181,127 tons. No estimates of anthracite production have been compiled owing to the few reports received.

# Machinery Markets and News of the Works

## SLIGHT DECLINE IN SALES

### Comparative Slackness Due to Inventory Period

### List Issued for 15 Tools by National Tube Co.—Export Inquiry Active

BUYING during the week fell off slightly as compared to the December rate, which was due largely perhaps to the taking of inventory, usual at this time of the year. There was, however, a fairly large number of sales of single machines, and pending inquiries are being cleared up by purchases. There is no lack of optimism as to the immediate future.

A list of 15 tools has been issued by the National Tube Co., for its McKeesport, Pa., works.

Buying by the automotive industry continues light. Two steam hammers will be purchased by the Nash Motors Co., during the week, following orders just placed for seven drop hammers and 12 light machine tools.

It is reported that the Baltimore & Ohio Railroad appropriation for tools probably will be made within the next few weeks. Other large railroad lists are not expected before the middle or latter end of February. The Peoria & Pekin Union bought a number of machine tools.

Action on its pending list of 24 engine lathes may be taken during the current week by the Chicago Board of Education.

Inquiry from foreign sources has been active, requests for prices having been received from Mexico, Europe and Japan. An order for six screw machines for the latter country was placed in Cleveland during the past week. Purchasing of a variety of equipment for Russia continues.

December bookings of machine tools were the best since April, according to figures of the National Machine Tool Builders' Association. The December index was 25.44, or 42.3 per cent of the average for 1920, against 20.85 for November, representing 34.6 per cent of the 1920 average monthly bookings. The December showing is 22 per cent better than November and nearly 60 per cent better than June, the low month of 1924.

## New York

NEW YORK, Jan. 13.

NEW business in machine tools has not developed to any considerable volume since the first of the year, a large part of recent activity having been in purchases on inquiries that accumulated last month, but inquiry, particularly for the smaller types of tools, is increasing. Inquiry for export has been developing to noteworthy proportions the past few weeks with requests for prices on a wide range of tools from Japan, Mexico and Europe, added to the continued activity in purchasing of all kinds of machinery for Russia.

The Worthington Pump & Machinery Corporation is reported asking for prices on a few grinding machines for its European plant. In domestic business the Worthington company has closed in the past week on several more tools for its Buffalo plant, including a turret lathe, and still has several machines pending. The American Radiator Co., which recently bought for its Buffalo plant, still has under consideration the purchase of a grinder and drilling machine. The General Electric Co., Schenectady, N. Y., has issued inquiries for a few additional machines.

Among the railroads, the New York Central has closed on several machines for which it has been in the market for some time and has two or three more pending. The Central Railroad of New Jersey, which has been buying heavy machines for boiler work and wheel turning, is expected to continue a fairly active purchaser of large tools for some time. The Baltimore & Ohio Railroad appropriation for tools will probably be made in the next week to 10 days and a fair volume of purchasing from this source is expected.

The Brooklyn Edison Co., Inc., Pearl and Willoughby Streets, Brooklyn, has plans for a one-story automatic power substation at 2502-12 Tilden Avenue, 55 x 100 ft., to cost about $85,000 with equipment. E. I. Olson is company architect.

Thomas W. Golding, 597 Fifth Avenue, New York, architect, has plans for a three-story automobile service, repair and garage building, 75 x 200 ft., at 4459-63 Broadway, to cost about $85,000.

The Director-General, Section of Municipalities and Local Commissions, Savoy House, Cairo, Egypt, will receive bids until Feb. 15, for a quantity of water works machinery, as per specifications on file.

Motors, power equipment, conveying machinery and other equipment will be installed in the proposed printing plant to be erected by the J. B. Lyon Co., Albany, N. Y., to cost $750,000.

The Consolidated Gas Co., 130 East Fifteenth Street, New York, is completing plans for a bond issue to approximate $30,000,000, a considerable portion of the fund to be used in connection with extensions and improvements during 1925, including the construction of additions to gas generating and steam power stations, etc. During the past year, the company is said to have expended about $69,000,000, in plant expansion.

Robert T. Lyons, 342 Madison Avenue, New York, architect, has completed plans for a seven-story automobile service, repair and garage building, 200 x 245 ft., at 109 West Fiftieth Street, estimated to cost $1,250,000 with equipment.

Malcolm H. Robertson, 200 Eleventh Avenue, New York, manufacturer of automobile lubricants, greases, etc., has leased the two-story factory at 604-8 East Nineteenth Street, for a new plant.

A merger has been perfected by the Morkrum Co., Chicago, and the Kleinschmidt Electric Co., Nelson Avenue, Brooklyn, both manufacturing telegraphic typewriting machines and parts, under the name of the Morkrum-Kleinschmidt Co., capitalized at $1,500,000. Plans are under way for extensions in the Chicago works on Wrightwood Avenue, to double approximately the present floor space of 40,000 sq. ft. Operations will be maintained at the Brooklyn plant for the time being, with intention later of removing to the Chicago site. Sterling Morton is president of the new company, and William Kleinschmidt, secretary.

S. G. S. Young, secretary Bombay, Baroda & Central Railway Co., 91 Petty France, Westminster, S. W. 1., London, England, is asking bids until Feb. 24 for electrical equipment for the Bombay, India, suburban railroads, including rotary converter sets; substation track-sectioning switchgear and accessory apparatus, transformers, etc., for automatic substations; automatic substation machinery and auxiliary equipment, as per specifications on file.

Rosen & Epstein, 1775 Pitkin Avenue, Brooklyn, architects, have completed plans for a four-story automobile service, repair and garage building, 50 x 100 ft., on West Thirty-seventh Street, New York, to cost about $100,000 including equipment.

initial units of its steam-operated electric generating plant, to cost $7,500,000 with machinery.

The Board of Education, Educational Building, Albany, N. Y., plans the installation of manual training equipment in the three-story junior high school to be erected on Delaware Avenue, estimated to cost $900,000, for which plans are being drawn by Marcus T. Reynolds, 100 State Street, architect.

The Staten Island Rapid Transit Railway Co., 25 Broadway, New York, has filed plans for three one-story automatic power substations near James Street, Atlantic; near the Old Town Road, Glasmere; and near Sand Lane, South Beach, to cost about $50,000. Work will proceed at once.

The Board of Education, Long Branch, N. J., is considering the installation of manual training equipment in a three-story high school at Westwood and Eastbourne Avenues, estimated to cost $1,000,000, for which bids will be asked on a general contract in the near future. A. E. Arend, Kinmouth Building, Asbury Park, N. J., is architect.

Adolph Segal, Pennsylvania Building, Philadelphia, head of the Newark Sugar Refining Co., Newark, recently formed with a capital of $5,000,000, has closed negotiations with the City Commission for the purchase of about 7 acres at Port Newark, and lease of waterfront property adjoining, to be used as a site for a new sugar refining plant. Plans will be prepared at an early date, with intention of having the initial unit equipped and ready for service early in the fall. It will have an output of about 5000 bbl. per day, to be increased later to about 10,000. The plant will cost more than $5,000,000, with machinery, including dock-loading and conveying apparatus, etc. It is purposed to use electrically-operated machinery exclusively.

The Newark Paraffine & Parchment Paper Co., 42 Jelliff Avenue, Newark, has awarded a general contract to the Sutherland-Allen Co., Inc., 14 Park Place, for a one-story addition, 75 x 100 ft., to cost approximately $30,000. G. E. Jones, Union Building, is architect.

The Horni Signal Mfg. Corporation, 153-55 Frelinghuysen Avenue, Newark, recently organized to manufacture metal traffic signals, etc., is disposing of a preferred stock issue to total about $200,000, practically the entire proceeds to be used for plant expansion and the installation of additional machinery.

The United States Tool Co., Inc., 119 Mechanic Street, Newark, manufacturer of jigs, dies, gages, etc., has acquired the plant of the General Electric Co., at Ampere, N. J., consisting of three buildings, totaling 83,000 sq. ft. of floor area. Possession will be taken on Feb. 1, when the new owner will establish a new plant at this location. The present works will be removed to the Ampere site and additional equipment installed. A. E. Borton is president.

The Hodgson-King Silica Co., recently organized to deal in silica sands for the glass industry and in uncrushed silica for making cement, will be in the market for machinery and plans to construct and operate its own works. Elmer King is one of the principals. Address in care of King & Vogt, 10 Washington Street, Morristown, N. J.

## Philadelphia

PHILADELPHIA, Jan. 12.

PRELIMINARY plans are being considered by the Air Reduction Sales Corporation, Germantown and Allegheny Avenues, Philadelphia, for the construction of a new local plant. Headquarters are at 342 Madison Avenue, New York.

The Susquehanna Water Power Co., an interest of the Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, will construct a power dam and hydroelectric generating plant on the Susquehanna River, vicinity of Conowingo, Md. The initial capacity will be 280,000 hp., with ultimate output 480,000. It will require about 36 months for completion and is estimated to cost $40,000,000, including steel tower transmission system. The entire production will be used by the parent company. Walter H. Johnson is president.

The Chamber of Commerce, Twelfth and Walnut Streets, Philadelphia, has received an inquiry from a company in India desiring to get in touch with American manufacturers of enamelware, aluminum-ware, cutlery, razors and kindred products.

The F. A. North Co., 1306 Chestnut Street, Philadelphia, manufacturer of pianos, has plans under way for a five-story repair and rebuilding plant, 30 x 175 ft., estimated to cost $160,000 with equipment. Amos W. Barnes, Perry Building, is architect.

The Department of Public Works, Philadelphia, George H. Biles, director, is planning for extensions and improvements in pumping plants and system, to include the installation of additional equipment at the Torresdale and other main pumping stations, estimated to cost $7,000,000. Water pipe construction and replacements are expected to cost approximately $6,000,000.

The Pennsylvania Railroad Co., Philadelphia, has investigations and estimates of cost under way for the electrification of different portions of its lines between Newark and Philadelphia, as well as to Wilmington, Del., and Washington, and proposes to begin initial work in the near future. An overhead wire system will be used and power will be furnished by the Philadelphia Electric Co. More than $10,000,000 will be expended in the Philadelphia district.

The Schutte & Koerting Co., Twelfth and Thompson Streets, Philadelphia, manufacturer of valves, steam specialties, etc., is said to have tentative plans for rebuilding the portion of its main plant at Cornwells, Pa., destroyed by fire Jan. 7 with loss reported at close to $70,000 including equipment.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: (43091) from Manuel Ugarte, Oliver 456, Valparaiso, Chile, desiring to get in contact with American manufacturers of equipment for a proposed iron foundry and plant for lead pipe production, the works being designed to manufacture sad irons, bath tubs, etc., also equipment will be desired for the production of enameled iron specialties; (43084) from Rafael Rodriquez Barril, P. O. Box No. 517, San Juan, Porto Rico, wishing to get in touch with American manufacturers of wire nails, barbed wire, wire staples, corrugated galvanized sheets, standard steel pipe and kindred specialties; and (43087) from Alfredo Corredor B. & Compania, 95 Carrera 4a, Cali, Colombia, desiring to get in contact with American manufacturers of agricultural machinery and tools, shovels, spades, etc.

The York Water Co., York, Pa., is planning for extensions in its plant and system to include the installation of two additional pumping units and accessory equipment.

The North Branch Transit Co., Bloomsburg, Pa., is planning to rebuild its repair shops and car barns destroyed by fire Jan. 6 with loss estimated at $125,000 including buildings and machinery.

The Lehigh Coal & Navigation Co., 437 Chestnut Street, Philadelphia, is planning for the installation of ventilating equipment at its Panther Creek Valley collieries, near Tamaqua, Pa., to cost approximately $100,000, including electric-operated fans and other mechanical draft apparatus.

The Christiana Machine Co., Manheim, Pa., is said to be planning the purchase of a planer, vertical boring mill and other equipment.

The Board of Education, Shillington, Pa., is considering the installation of manual training equipment at its proposed two-story high school, estimated to cost $100,000, for which it is expected to ask bids on a general contract at an early date. Frederick A. Muhlenberg, Ganster Building, Reading, Pa., is architect.

Tanks, refrigerating machinery, conveying equipment, power plant apparatus, etc., will be installed in the proposed plant to be erected at Queen Boulevard and Honeywell Street, Long Island City, by the Breyer Ice Cream Co., Eighth and Cumberland Streets, Philadelphia, to cost $500,000. H. W. Breyer is president.

The Miller Lock Co., Philadelphia, is in the market for a No. 22 New Britain chucking machine.

The Delaware Seamless Tube Co., Auburn, Pa., is inquiring for an upsetting and forging machine, 1½ to 2½ in. capacity; also a straight side press with capacity of a 4-A Bliss or greater.

The Ford Motor Co., Detroit, is reported to be considering the purchase of the property of the Merchants' Shipbuilding Co., Chester, Pa., for the establishment of a new assembling plant to cost more than $1,000,000. The company purchased a site for this purpose a number of months ago in the southwestern section of Philadelphia, but owing to the marshy character of the soil for steel and concrete buildings, has abandoned plans to locate here.

## Buffalo

BUFFALO, Jan. 12.

BIDS will be received by William F. Schwartz, commissioner of public works, Municipal Building, Buffalo, until Jan. 19 for five surface condensers and accessory equipment for installation at the Ward pumping station as per specifications on file.

The Carborundum Co., Niagara Falls, N. Y., manufacturer of abrasive materials, has awarded a general contract to the Braas Brothers Co., 1110 Whitney Avenue, for a one-story addition, 50 x 100 ft., to cost $30,000.

The Whiting-Gramm Motor Corporation, Niagara Falls, N. Y., is said to be contemplating the erection of a new plant for the manufacture of airplanes, motors, etc., to cost approximately $80,000.

## The Crane Market

THERE is continued inquiry for single cranes in the overhead field and a fair degree of activity in locomotive cranes. Of the larger inquiries for overhead cranes, the General Electric Co. still has four of small capacity pending for Cincinnati, having closed for the nine cranes for West Philadelphia and three for Detroit with the Northern Engineering Works. Action is expected before long on the 120-ton overhead crane for the Phoenix Utility Co. and the 200-ton cranes for the New York Edison Co. The Phoenix Utility Co., 71 Broadway, New York, is also asking for prices on a large hoist for a sluice gate, of sufficient capacity to lift 165,000 lb., 40-ft. in thirty minutes. Messrs. C. P. Sandberg, 100 Broadway, New York, consulting engineers, are in the market for an 80-ton and a 5-ton electric traveling crane for the Royal State Railways of Siam.

Crane awards have been fewer in the Pittsburgh district, but all builders have heavy quotation lists and are looking for good business. It is stated that no less than 60 cranes will be wanted by the Carnegie Steel Co. in the rehabilitation of its Homestead works, to say nothing of the cranes that will be needed for the new open-hearth furnace plant at Mingo, Ohio, and four or five cranes which will be installed in the extension of the bar mills at McDonald, Ohio. Jones & Laughlin Steel Corporation will install a 15-ton Cleveland overhead crane at its river terminal and warehouse at Memphis, Tenn. This crane was originally ordered for installation on a dock project in Pittsburgh, which has been deferred temporarily.

Among recent purchases are:

International Cement Co., New York, a 25-ton locomotive crane from the Link-Belt Co. and a 3-cu. yd. bucket handling crane from the Milwaukee Crane & Mfg. Co.

Alabama State Dock Commission, a 25-ton locomotive crane from the American Hoist & Derrick Co.

Alabama, Tennessee & Northern Railroad, a ⅝-cu. yd. ditcher from the American Hoist & Derrick Co.

American-La France Fire Engine Co., Elmira, N. Y., a 5-ton, 22-ft. span hand power crane from Alfred Box & Co.

Gulf Refining Co., Jacksonville, Fla., a 5-ton, 37-ft. 3-in. span, 1-motor overhead crane from Alfred Box & Co.

Pennsylvania Railroad, a 25-ton gantry crane for installation at Cincinnati, from the Whiting Corporation.

American Tube & Stamping Co., Bridgeport, Conn., a 3-ton, 25-ft. span, double hook overhead crane from an eastern Pennsylvania builder.

C. H. Masland & Sons, Philadelphia, a 5-ton, 40-ft. span overhead traveling crane from an Eastern crane builder.

J. R. Buckwalter Lumber Co., Union, Miss., a log loading crane from the American Hoist & Derrick Co.

Baker Construction Co., Great Neck, L. I., N. Y., a used 10-ton, 40-ft. boom Brownhoist, crawl tread, locomotive crane from Philip T. King, New York.

Public Service Production Co., Newark, N. J., a 15-ton, 17-ft. 9-in. span hand power crane from Alfred Box & Co.

American Steel & Wire Co., Donora, Pa., a 25-ton, 75-ft. span overhead crane from the Morgan Engineering Co.

Duquesne Light Co., Pittsburgh, a 25-ton, 63-ft. 10-in. span overhead crane from Manning, Maxwell & Moore, Inc., Shaw Crane works.

Standard Slag Co., Youngstown, Ohio, a 22½-ton locomotive crane from the Ohio Locomotive Crane Co.

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The Sterling Furniture Co., 16 Nelson Avenue, Salamanca, N. Y., has tentative plans under advisement for a four-story addition, 72 x 80 ft., to cost $75,000 with equipment. W. O. Frederickson is head.

The Binghamton Light, Heat & Power Corporation, Binghamton, N. Y., is arranging for extensions in its power plants, sub-stations and power transmission lines for service in Broome, Chenango, Cortland and Tioga counties. The company is operated by the General Gas & Electric Corporation, 50 Pine Street, New York.

J. H. Warder, Niagara Falls, N. Y., and associates have organized the Warder Paper Box Corporation, which has acquired the paper box and container plant of the Marsh-Burgess Co., West Third Street, Dunkirk, N. Y., and will take immediate possession. Plans are under consideration for extensions and additional equipment.

The Lundell-Eckberg Mfg. Co., 22 Market Street, Jamestown, N. Y., manufacturer of metal window frames, has filed plans for a one-story brick and steel addition to cost $25,000 exclusive of equipment.

A general contract has been awarded by the Buffalo Sintering Corporation, Marilla Street, Buffalo, for the erection of a one-story steel plant to cost $25,000.

## Chicago

CHICAGO, Jan. 12.

ALTHOUGH the past week has not been devoid of activity, buying has receded from the December rate. The Nash Motors Co. has closed for two 2000-lb., two 1500-lb., and three 1000-lb. board drop hammers for its Kenosha forge shop and is expected to place orders in the current week for a 4000-lb. and a 2000-lb. steam hammer. The same company has purchased a few light tools, including eight polishing lathes, one surface grinding machine, a keyseating machine and two hand milling machines. The Springfield Boiler Co., Springfield, Ill., recently ordered two American special boiler drilling units with two radial drills on each unit, calling for an expenditure of $29,000. The same company purchased a drill grinder. The P. B. Yates Machine Co., Beloit, Wis., which recently bought considerable equipment, has added orders for two Micro internal grinding machines.

The large railroad lists in course of preparation will probably not be issued until some time in February. The Peoria & Pekin Union, however, has closed for $60,000 worth of tools, including a driving wheel lathe, a car wheel lathe, an axle lathe, four hydraulic presses, several drill presses, a 6-ft. radial drill, and three engine lathes. The Elgin, Joliet & Eastern has purchased a special Chambersburg 300-ton hydraulic press for its Joliet, Ill., shop. Among the railroad equipment builders, the Streator Car Co., Streator, Ill., has purchased a 32-in. shaper and the Union Metal Products Co., Chicago, has closed for two Chambersburg 2000-lb. board drop hammers. A 300-lb. Chambersburg board drop hammer has been ordered by the Richards-Wilcox Co., Aurora, Ill. The Chicago Board of Education may take action on its pending list of 24 engine lathes some time this week.

The William F. Klemp Co., manufacturer of steel gratings, 2131 Turner Avenue, Chicago, has purchased from the Clearing Industrial District 22,500 sq. ft. in its eighth industrial subdivision. The property is improved with a one-story building containing 12,000 sq. ft. of floor space and is served with a switch track from the Belt Railroad. Joseph F. Hora has purchased the plant of the Klemp company at 2131 Turner Avenue and has leased it to the Anchor Mfg. Co., manufacturer of concrete mixers.

The Quality Metal Bed Co., 410 North Western Avenue, Chicago, has purchased from the Henry Schomer Co., 55,000 sq. ft. at 1800 South Kilbourn Avenue, improved with a one-story saw-tooth factory containing 35,000 sq. ft. and served by a three-car switch. The buyer contemplates making improvements costing $75,000.

Edward P. Steinberg, 109 North Dearborn Street, Chicago, is receiving bids on a one-story factory and store, 60 x 160 ft., Indiana Avenue and Twenty-fifth Street, for the J. G. Sanderson Auto Reconstruction Co., to cost $35,000.

The Delta Star Electric Co., 2433-59 Fulton Street, Chicago, has awarded contract for a one-story addition, 54 x 126 ft., at 250-254 North Artesian Avenue, to cost $25,000.

The Brass Foundry Co., Peoria, Ill., is installing an electric melting furnace. If the unit proves successful, a second electric furnace will be installed later. Heretofore gas-fired crucibles have been employed.

The Wagner Malleable Iron Co., Decatur, Ill., plans the erection of a foundry addition which will include the construction of furnace and shipping rooms, to cost $60,000.

The Mueller Co., Decatur, Ill., has acquired the foundry of Chambers, Bering & Quinlan and will utilize the building as a vitreous ware department in which lavatories and other plumbing earthenware will be manufactured.

Fire recently damaged the plant of the Fruit Growers Express Co., at East Chicago, Ind.

The Tool & Screw Corporation, 1800 Fourteenth Avenue, Rockford, Ill., will soon take bids on a general contract for a two-story addition, 65 x 185 ft., to cost $30,000. Peterson & Johnson, Swedish-American Bank Building, are architects.

The Central Illinois Public Service Co., Springfield, Ill., is disposing of a note issue to total $4,800,000, a portion of the proceeds to be used for extensions and improvements in power plants and system, including the acquisition and

betterment of properties at Quincy and Joliet, Ill. Marshall E. Sampsell is president.

Officials of the Holly Sugar Co., Kittredge Building, Denver, Colo., have organized the Midland Sugar Co., to construct and operate a new beet sugar mill at Sidney, Mont., to cost close to $800,000 with equipment. The parent organization acquired a number of months ago the plant of the Anaheim Sugar Co., Anaheim, Cal., and will dismantle this mill, removing equipment to the new location.

The Board of Directors, St. Anthony's Home for the Aged, Davis and Windsor Avenues, Dubuque, Iowa, is considering rebuilding the power house at the institution, recently destroyed by fire with loss estimated at $90,000, including equipment.

The Christopher Motor Sales Co., Sheffield Avenue, Chicago, will soon take bids for a one-story addition to its machine shop, 50 x 125 ft., at 2308-10 Sheffield Avenue, including improvements in the present shop. A. L. Salaman, 10 North Clark Street, is architect.

The Colorado Fuel & Iron Co., Pueblo, Colo., is completing plans for the complete electrification of its local mills, to cost close to $2,500,000.

The Iowa Falls Electric Co., Washington Avenue, Iowa Falls, Iowa, has secured permission for the construction of a hydroelectric generating plant to cost in excess of $650,000, and will proceed with work at an early date.

Manual training equipment will be installed in the Warren Harding junior high school, three stories, to be erected at Des Moines, Iowa, estimated to cost $500,000, for which a general contract has been awarded to the Arthur H. Newman Construction Co., Hubbell Building (Boyd & Moore, Insurance Exchange Building), are architects.

The Rockford Show Case Co., Rockford, Ill., will soon ask bids for a three-story addition, 20 x 90 ft., to cost approximately $30,000, for which plans are being completed by Peterson & Johnson, Swedish-American Bank Building, architects.

The Board of Education, Alton, Ill., is considering the installation of manual training equipment in its proposed three-story high school, estimated to cost $400,000, for which it is planned to ask bids on a general contract in the spring. Royer, Danely & Smith, Flatiron Building, Urbana, Ill., are architects.

## New England

BOSTON, Jan. 12.

LOCAL machine-tool business is showing signs of life, although activity is confined more to prospects than orders. Sales the past week, however, in most instances were confined to a tool here and there, mostly new equipment, the most important consisting of a large New England made milling machine and a large planer. Used equipment sold included a milling machine, shaper, punch press and a 16-in. lathe. Dealers have a number of inquiries for small lots of equipment, and it is understood several lists issued in 1924 will become active this year.

No price changes of importance have been announced by machine-tool builders since Jan. 1. Quotations on the surface appear firm, yet competition on recent business resulted in reductions in list quotations. The resumption of auction sales in New Jersey and Connecticut is looked upon with some misgivings by local used machinery houses.

Plans have been completed for a three-story, 50 x 120 ft., trade school to be erected in Roxbury, Boston. McLaughlin & Burr, 88 Tremont Street, Boston, are the architects.

Sketches are being made for a one-story, 300 x 1160 ft., assembling plant to be erected by the Ford Motor Co. on Middlesex Avenue, Somerville, Mass. Albert Kahn, 1000 Marquette Building, Detroit, is the architect.

The city of Marlboro, Mass., has awarded contract for a three-story and basement, 80 x 100 ft., high school addition to contain manual training shops. Charles M. Baker, 25 Arch Street, Boston, is the architect.

Contract for the construction of three additions to the United Illuminating Co., Bridgeport, Conn., plant has been awarded, to cost in excess of $800,000 without equipment. The job completed will cost about $1,550,000.

Bids will be received by the Bureau of Yards and Docks, Navy Department, Washington, until Jan. 21 for electrically-driven capstans for the Portsmouth Navy Yard, specification 5024.

The Apco Mfg. Co., Providence, R. I., manufacturer of radio batteries and equipment, has plans under way for expansion, with additional machinery installation. A stock issue of $625,000 is being sold, practically the entire proceeds to be used for the work. Thomas F. Wilson is president.

The Boston & Maine Railroad Co., Boston, has taken out a permit to build a one-story engine house with repair facilities at 70 Cambridge Street.

The Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn., is said to be planning the early purchase of electrical equipment for its plant, including a 400-kw. motor-generator set with motor, starting devices, switchboard, instruments, etc.

The Thomas Plow Co. and the Charles H. Adams Novelty Wood Co., Bangor, Me., have been consolidated under the name of the Thomas-Adams Co. to manufacture snow plows, wood specialties, etc. The new company has arranged for removal to East Deering, Me., where a main plant will be established and operated.

The Crane Co., 115 Front Street, Hartford, Conn., with headquarters at Chicago, has awarded a general contract to the Industrial Construction Co., 721 Main Street, for a one-story addition to its local factory branch and distributing works, including improvements in the present building.

The Beacon Oil Co., 111 Devonshire Street, Boston, manufacturer of lubricating oils, greases, etc., is considering the erection of a two and three-story addition to its plant at Everett, Mass., to cost about $55,000 with equipment.

## Cincinnati

CINCINNATI, Jan. 12.

BUYING of machine tools fell off slightly the past week as compared with the one previous, but there is no lack of optimism regarding the future. Manufacturers confidently expect that the demand will shortly show considerable improvement. A fairly large number of orders for single machines have been placed and many old inquiries are being closed. A local machine tool manufacturer placed one of the largest orders received, consisting of three machines. Dealers report a slowing up in purchases, caused largely by the fact that inventories were being completed, and also to an evident desire to wait until the general trend of business is more firmly developed. A large amount of business has been placed for electric motors and rumors are current that an advance in prices will shortly be made.

The Champion Coated Paper Co., Hamilton, Ohio, will award contract for a large addition to its plant, in which paper making machinery will be installed.

The U. S. Can Co., Cincinnati, will erect a plant in the Chicago district, contract having been let for the building which is expected will be in operation May 1. O. C. Huffman is president.

The Casey Boiler Works, Springfield, Ohio, has inquiries out for a brake, 90 in. wide, to handle material up to one-quarter inch thick, for power or hand operation.

T. J. Saltzman, Carrolton, Ohio, and associates, have plans under advisement for a four-story automobile service, repair and garage building at Canton, Ohio, estimated to cost $150,000 with equipment.

The Tennessee Electric Power Co., Nashville, Tenn., is considering plans for the construction of a hydro-electric generating station in the mountain district in northern Georgia, estimated to cost $2,500,500 with transmission system. B. C. Edgar is vice-president.

The plant of the Miami Brass Foundry Co., Bacon and McDonough Streets, Dayton, Ohio, has been acquired by George Behm & Sons, 624 Wayne Avenue, hardware and glass products. The purchasing company will devote its operations to glass exclusively in the future, and plans to occupy the acquired building shortly.

The Board of Education, Willard, Ohio, plans the installation of manual training equipment in its proposed two-story high school estimated to cost $175,000, for which bids will be asked on a general contract this month. Granville E. Scott, Citizens' National Bank Building, Norwalk, Ohio, is architect.

E. W. Cooper, 174 Third Street, North, Nashville, Tenn., engineer, has inquiries out for a hammer mill, Williams type; two 75 hp. slip ring motors, three-phase, 60 cycle, 220 volts, and several 50 kva. transformers.

The Imperial Elkhorn Coal Co., Sergent, Ky., is contemplating extensions in its mining plant to double the

CONSECUTIVE Photographic Displays, Charts and Early Models, Showing the Progress of Industries from Earliest Beginnings Down to the Present Time, Featured an Exhibit by the National Museum of Engineering and Industry at the Recent Power Show in New York. The exhibit was a step in the movement to complete a national endowment of $10,000,000 to establish a great museum of engineering and industry at Washington

present capacity. Additional equipment will be installed, including hoisting machinery, power apparatus, etc.

The Hopple Handle Co., Tiffin, Ohio, operated by William H. Hopple, is said to be planning the early rebuilding of the portion of its works recently destroyed by fire with loss estimated in excess of $150,000, including equipment.

The Board of Works, Nashville, Tenn., has plans under way for the installation of new steam power equipment at the municipal waterworks, including improvements in present apparatus, estimated to cost $200,000.

The Love Motor Generator Co., Columbus, Ohio, organized with capital stock of $50,000, will manufacture generating equipment. Contracts will be awarded soon for the work, since the company is not planning to build for a while. Robert E. Love is one of the principals.

The Shartle Machine Co., P. O. Box 412, Columbus, is in the market for two or three 500-hp. water-tube boilers, either Stirling or Babcock & Wilcox, to meet the Ohio boiler inspection for not less than 180 lb. working pressure. It is to be complete but without stacks. George Shartle is president.

## Milwaukee

MILWAUKEE, Jan. 12.

MOMENTUM is gradually being gained by the machine-tool market, which since the opening of the year has shown signs of substantial betterment. Inquiry is improving and sales are more active. Local industries have been buying a limited amount of equipment. The employment situation in foundries and machine shops have improved materially since the holidays, and a number of payrolls have reached a new peak since last summer. Manufacturers of farm machinery are preparing the way for meeting the best demand in at least four years and may be expected to be important factors in equipment buying within a relatively short time.

The Crane Co., Chicago, has purchased the property at Market and Pearl Streets, in Oshkosh, Wis., and will raze the buildings to provide for a new branch shop, warehouse and office building, 78 x 240 ft., two stories and basement. T. R. Brady is manager of the Oshkosh branch.

The Frank Hamacheck Machine Co., Kewaunee, Wis., incorporated recently with $500,000 capital to take over the foundry and machine shop business of Frank Hamacheck, Sr., who becomes president, expects to enlarge its works and provide additional equipment, largely to increase its principal output, that of green pea-hulling machinery, used in canneries. V. A. Hamacheck is vice-president; E. W. Classon, secretary, and Frank Hamacheck, Jr., treasurer.

The Val-Tui Corporation of Milwaukee has been organized by Frank Alioto, 273 Jefferson Street, and associates to manufacture a line of manual tools and special automotive appliances, valve adjusters, etc. A shop is to be equipped at once in leased quarters.

The Special Machinery & Mfg. Co., 1919 St. Paul Avenue, Milwaukee, sustained an estimated loss of $5,000 by fire on Jan. 5. The rear end of the machine shop was burned, but repairs are being made and only unimportant replacements of equipment will be necessary. Max P. Janisch is general manager.

The Drummond Packing Co., Eau Claire, Wis., meat packer, has engaged the B. K. Gibson Co., consulting engineer, 624 South Michigan Street, Chicago, to design a fourth story addition to its plant. With equipment the work will cost about $38,000.

The Fond du Lac, Wis., Board of Education will close bids Jan. 31 for the construction of two $200,000 additions, one to the Roosevelt junior high and vocational school, and the other to the Central high school. Plans are by Perkins, Fellows & Hamilton, 814 Tower Court, Chicago, architects. The structures are to be completed Sept. 1 and equipment will be purchased about Aug. 1. J. F. Hohensee is secretary of the school board.

## Cleveland

CLEVELAND, Jan. 12.

WHILE there is a fair demand for single machines, the increased activity looked for after the first of the year has not yet developed and new inquiries are confined for the most part to single machines. There is still a tendency among buyers to withhold purchases until machines are actually needed. The automobile field continues quiet. Japan is the only export market that is showing any life and recent orders from that country include six automatic screw machines placed with a Cleveland manufacturer. The Marvel Equipment Co., Cleveland, maker of automobile accessories, purchased a press during the week and will build extensions for which a number of tools will probably be required.

Used machinery is in good demand and there is a scarcity of plain milling machines and shapers in good tools.

The Austin Co., Cleveland, has recently taken the following contracts for new plants and extensions: Repair shop and storage building for the Rolls-Royce Co. of America, Inc., Springfield, Mass.; one story factory for the F. W. Wakefield Brass Co., Vermilion, Ohio; steel frame buildings for the Hygeia Nursing Bottle Co., Buffalo; office building, 60 x 80 ft. and factory buildings, 72 x 320 ft. for the G. & W. Electric Specialty Co., Chicago, manufacturer of high tension fuse boxes and specialties and one story steel frame building, 54 x 125 ft. for the Delta Star Electric Co., Chicago, manufacturer of high tension power line equipment.

The Mueller Electric Co., 1583 East Thirty-first Street, Cleveland, has taken bids for a one-story addition, 35 x 60 ft. The George S. Rider Co., Century Building, is structural engineer.

The Stark Brick Co., East Canton, Ohio, will build two one-story factory buildings, 45 x 100 ft. and 72 x 100 ft., respectively. Contract for the structural steel and erection has been placed with the Canton Bridge Co.

A. W. Murphy, Penton Building, Cleveland, is having plans prepared for a two-story and basement building, 40 x 118 ft., for light manufacturing purposes.

The Renedy Mfg. Co., Van Wert, Ohio, manufacturer of sheet metal products, has taken bids for a one-story and basement factory, 100 x 100 ft.

Manual training and metal-working departments will be provided in the new Garfield high school, Akron, Ohio, contract for which has just been awarded.

A. H. Robinson, 5103 Detroit Avenue, Cleveland, manufacturer of heating furnaces, is having plans prepared for two one-story factory buildings, one 60 x 60 ft. and the other 60 x 100 ft. to be built in Olmstead Falls, Ohio.

H. S. Willard, Jr., and associates, Wellston, Ohio, have

preliminary plans for a one-story foundry, 100 x 200 ft., for which considerable equipment will be required.

The Herbrand Co., Fremont, Ohio, manufacturer of forgings, etc., has awarded a general contract to the Steinle & Wolfe Construction Co., Fremont, for a one-story steam-operated power plant with capacity of 500 hp., for service at its proposed new plant.

## Detroit

DETROIT, Jan. 12.

TENTATIVE plans are being considered by the Regent Stove Works, Mulberry Avenue, Wyandotte, Mich., with Detroit office at 52 Chicago Boulevard, for a new assembling plant and other works to replace the portion of its plant recently destroyed by fire with loss reported in excess of $65,000. T. H. Conway is president.

C. L. Frost & Son, Grand Rapids, Mich., manufacturers of hardware products, have completed plans for a new factory and will proceed at once with foundations. It is estimated to cost $50,000.

The Zagelmeyer Cast Stone Co., Twelfth Street and the Detroit Railroad, Detroit, is completing plans for new works, consisting of three buildings and power house to cost $75,000 with equipment. Frank Zagelmeyer is president.

The Cass-Baltimore Garage Co., Detroit, has leased a three-story and basement building, 120 x 155 ft., to be erected at Cass and Baltimore Avenues, Detroit, estimated to cost $150,000, for a new service, repair and garage building. Albert Kahn, Marquette Building, is architect.

The Detroit Edison Co., Detroit, is arranging a 1925 construction and improvement program to cost approximately $16,000,000. The work will include extensions in the power plant at Trenton Channel, near Trenton, Mich., to develop a total output of 150,000 kw., steel tower transmission lines, automatic substations and betterments in existing stations and system.

The Peerless Portland Cement Co., First National Bank Building, Detroit, is disposing of a bond issue of $1,750,000, a portion of the proceeds to be used for the completion of its new mill now in course of building on the River Rouge, Detroit city limits. Colonel William M. Hatch is president.

The Common Council, Escanaba, Mich., has preliminary plans for the electrification of the municipal waterworks, with improvements in pumping machinery and auxiliary apparatus.

The Consumers' Power Co., Jackson, Mich., is planning for an extension and improvement program during 1925 at Kalamazoo, Mich., and vicinity, estimated to cost $1,000,000, including additional power station construction, line extensions, equipment, etc.

The Bryant Paper Co., Alcott Street, Kalamazoo, Mich., has awarded a general contract to Ray D. Boyer, 208 West Cedar Street, for a one-story machine shop, to cost $30,000.

## St. Louis

ST. LOUIS, Jan. 12.

BIDS are being asked until Jan. 21 by Charles N. Hamilton, city clerk, Wetumka, Okla., for equipment for a municipal waterworks and electric power plant, including pump room, filter plant, power house and cooling pond; hydraulically-operated filter equipment with capacity of 500,000 gal. per day, one 500-gal. per min. marine engine unit, one 350 and one 250 gal. per min. motor-driven pumping units, two 200-hp. oil engine-generator sets complete, with oil storage tanks, switchboard apparatus, etc. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

The Arkansas Ice & Cold Storage Co., Fayetteville, Ark., is arranging for the complete electrification of its ice-manufacturing plant, to cost approximately $50,000 with equipment.

The Kansas City Steel & Wire Co., Kansas City, Kan., Harry J. Kaelin, City Hall, treasurer, will break ground about Feb. 1 for its proposed plant at Twelfth Street and the Terminal tracks, and will erect the initial structures by day labor, including two one-story structures, 100 x 150 ft., and 80 x 250 ft., respectively. The installation will include wire and nail machinery, hydraulic presses, cooling bins, etc. It will cost approximately $500,000 with equipment.

The Gay Oil Co., 301 West Third Street, Little Rock, Ark., is considering plans for a three-story automobile service and repair works with departments for top manufacture, battery and electrical work, etc., estimated to cost $100,000 with equipment. T. J. Gay is president.

Ovens, power equipment, conveying machinery and other equipment will be installed in the addition to be erected at the plant of the Kansas City Macaroni & Importing Co., 562 Campbell Street, Kansas City, Mo., estimated to cost $135,000.

Manual training equipment will be installed in the two-story Eugene Field junior high school to be erected at Hannibal, Mo., estimated to cost $175,000, for which it is expected to ask bids on a general contract at an early date. M. S. Martin, Odd Fellows Building, is architect.

The Common Council, Claremore, Okla., is said to have preliminary plans for extensions and improvements in the municipal waterworks, including the installation of additional pumping machinery and other equipment, estimated to cost $100,000.

The Packard Motor Co., Tulsa, Okla., has leased a three-story and basement building, 100 x 135 ft., to be erected at Twelfth and South Boston Streets, to cost about $90,000, for a new service, repair and garage building. A. C. Fabry, Commercial Building, is architect.

## Indiana

INDIANAPOLIS, Jan., 12.

PRELIMINARY plans are being prepared by the Standard Steel Car Co., Hammond, Ind., for several one-story additions, with improvements in existing buildings, and the installation of additional equipment. It is expected to begin work in the spring. Headquarters are in the Frick Building, Pittsburgh.

Motors and power equipment, conveying apparatus, steel rolling curtains and other equipment will be installed in the new five-story factory, 146 x 250 ft., to be erected at McCarty Street and Madison Avenue by the Eli Lilly Co., 700 South Alabama Street, Indianapolis, manufacturer of chemicals, compounds, etc., estimated to cost $1,000,000. Robert F. Daggett, Consolidated Building, is architect; and Charles R. Ammerman, Occidental Building, mechanical engineer.

A. F. Hoppe, Indianapolis, has completed plans for the establishment of an electrical repair and parts shop at 3321 East Tenth Street.

The Marion Drop Forge Co., Marion, Ind., is said to be considering plans for a one-story addition, to be used primarily as a heat treating building, and for one crane runway. It is purposed to break ground early in the spring. The cost is reported in excess of $25,000.

The Board of Trustees, Indiana State Reformatory, Pendleton, Ind., has arranged a general construction and improvement program for 1925, to cost approximately $940,000. The work includes two new vocational schools, to cost about $34,000, and a one-story vocational foundry to cost approximately $20,000. Herbert Foltz, Wild Bank Building, Indianapolis, is architect. J. H. O'Neall, reformatory building, is purchasing agent.

The City Council, Anderson, Ind., is planning to purchase a 5000-kw. turbine-engine unit for the municipal electric power plant, with accessory equipment. M. H. Downey, City Hall, is engineer.

The Board of Education, Fort Wayne, Ind., is planning the installation of manual training equipment in the proposed Northside high school estimated to cost $500,000, for which Charles R. Weatherhogg, 250 West Wayne Street, architect, will prepare plans. Bids will be asked on a general contract in the near future.

The plant of the Young Car Works, manufacturer of mine cars, Evansville, Ind., was recently damaged by fire.

## South Atlantic States

BALTIMORE, Jan. 12.

THE Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is arranging a fund of about $7,750,000 for a construction and improvement program in 1925, including extensions and betterments in power plans, sub-stations and system. J. E. Aldred is president.

The Stoneville Cabinet Co., Stoneville, N. C., has plans under way for a new factory and will purchase complete woodworking machinery at an early date. A steam-operated electric power plant will also be installed. D. C. Kickler is secretary.

The Young Mercantile Co., Cedartown, Ga., is planning the purchase of equipment for a fertilizer mixing plant.

Boggs & Ikerd, Claremont, N. C., contractors, are in the market for a dipper dredge, Marion type, about 1¼ yd. capacity.

The office of the chief of air service, United States Army, Washington, will take bids until Jan. 20 for 20,000 ft. flexible steel cable, 1/16-in. diameter, circular CAS 76; until Jan. 26 for miscellaneous airplane fittings, circular CAS 75.

The Common Council, Davisboro, Ga., has plans for the construction of a municipal electric light and power

house estimated to cost $27,000. J. B. McCrary & Co., Bellwood Avenue, Atlanta, Ga., is engineer.

Hall & Mitchell, Keswick, Va., are in the market for a steam shovel, about ¾-yd. capacity, crawler type.

Nathan E. Burdette, Damascus, Md., is considering the construction of a new plant at Rockville, Md., for the manufacture of cement blocks, bricks and kindred products.

The general purchasing officer, Panama Canal, Washington, will take bids until Jan. 30 for valves, pipe fittings, electric motors, railroad crossing signals, bolts, nuts, rivets, reamers, punches, hammers, wrenches, switches, etc., Panama circular 1650; until Jan. 17 for cast iron pipe unions, knife switches, cast iron traps, brass steam hose couplings, boiler patch bolts, galvanized lag screws, mitre boxes, hexagon nuts, etc., Panama circular 2369.

The Fire Proof Building Materials Co., 1522 Main Street, Columbia, S. C., is planning the installation of concrete making machinery. Inquiries are being made for details and prices.

The Hackley-Morrison Co., 1708 Lewis Street, Richmond, Va., has inquiries out for a double drum electric hoist, 40 hp. capacity, with three-phase, 60 cycle, 220-volt motor; also for a motor-generator set, about 75 kw. capacity, and for one clam shell bucket, about ¾-yd. capacity.

O. L. Williams and Frank A. Schinn, Sumter, N. C., have organized a company to construct and operate a factory to manufacture furniture. A site is being selected. The initial works are reported to cost approximately $45,000.

The South Carolina Power & Light Co., Kingstree, S. C., has acquired the electric light and power plant at Lake City, S. C., heretofore under municipal direction. Extensions and improvements are planned, including the installation of additional equipment. The local ice-manufacturing plant has also been taken over.

The United Shipping Board, 3848 Navy Building, Washington, is asking bids until Jan. 27 for large quantities of plastic fire brick and fire clay refractories, required during a period of six months, proposal 1701.

The R. S. Armstrong & Brother Co., Atlanta, Ga., machinery dealer, has inquiries out for a 150 kw. generator, 2300-volts, three-phase, 60-cycle, direct-connected to steam engine; also for a similar generator-engine set, 50 to 75 kw. capacity, and for a number of d.c. motors from ½ to 5-hp. capacity.

The Board of Education, Columbus, Ga., plans the installation of manual training equipment in a proposed high school in the Wildwood Park section estimated to cost $400,000. Hickman & Martin, Swift Building, are architects.

The Board of Education, Hendersonville, N. C., is considering the installation of manual training equipment in its proposed three-story high and elementary school, estimated to cost $225,000, for which bids will soon be asked on general contract. E. G. Stillwell, Hendersonville, is architect.

The Sani-Safe Mfg. Corporation, 608 Lexington Building, Baltimore, recently organized to manufacture metal boxes of 24-gage galvanized sheets, will buy paint-spraying equipment, dies, presses, cabinet locks, rivets and screws. William E. Smith is one of the principals.

W. B. Townsend, Red Springs, N. C., is reported to be in the market for electrically operated refrigerating machinery, in connection with the erection of an ice-manufacturing plant.

## Pacific Coast

SAN FRANCISCO, Jan. 7.

PLANS are being prepared by the Laher Automobile Spring Co., 167 Hayes Street, San Francisco, for a one-story factory on Twenty-sixth Street, Oakland, Cal., 135 x 315 ft. Emil Schacht, Portland, Ore., is architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Jan. 20 for one motor-driven metal-cutting machine, schedule 3104; until Jan. 27, for one concrete mixer, schedule 3125; 8000 sq. ft. copper wire cloth, schedule 3146; and for 5000 sheets of tin plate, schedule 3143, all for the Mare Island Navy Yard; until Jan. 20, for one electric-driven hoist and trolley, and spare parts, for the Puget Sound Navy Yard, schedule 3124.

The Pure Ice Co., Calexico, Cal., is arranging for the erection of a one-story ice-manufacturing plant to cost $85,000 with equipment. A similar plant is also projected at Brawley, Cal., to cost a like amount. H. B. Mason, 3526 West Slauson Avenue, Los Angeles, is architect and engineer.

The Lewis River Paper & Pulp Co., Kelso, Wash., headed by Alfred Bowen, Portland, Ore., and associates, is considering plans for a new pulp mill in the Martins Bluff section, Columbia River, estimated to cost $100,000 with equipment.

The Pacific Power & Light Co., Portland, Ore., is arranging an expansion program in the Lewiston-Clarkson, Idaho, district during 1925, to cost about $250,000, including extensions in power stations and the installation of additional equipment. The company is also arranging for similar work in the vicinity of Walla Walla, Wash., estimated to cost $105,000.

The City Council, Tombstone, Ariz., is arranging a bond issue for the installation of a proposed municipal electric light and power, and ice-manufacturing plant. Bids will soon be asked. R. V. Saunders is city clerk.

The Butte City Ranch, Butte City, Cal., is planning for the installation of an irrigation system to include five electric-operated pumping plants, using centrifugal pumping units with accessory apparatus.

James R. Baker, 632 South Aurora Street, and J. E. Morgan, 1015 West Willow Street, Stockton, Cal., are at the head of a project to construct and operate a mill at Peters, near Stockton, for the manufacture of gunpowder, explosives, etc., to cost approximately $200,000, with equipment.

The Ramsdell Mines Co., Tucson, Ariz., has plans for the construction of a new flotation mill at its Sunshine mining properties, estimated to cost $50,000 with equipment.

The California Sea Products Co., Salinas, Cal., is completing plans for the construction of new works for the manufacture of fertilizer products in the vicinity of Moss Landing, estimated to cost $45,000 with equipment.

The Pan-American Petroleum Co., Los Angeles, is arranging for the construction of a new oil storage and distributing plant on city tideland property at San Diego, Cal., estimated to cost $500,000 with equipment.

## Pittsburgh

PITTSBURGH, Jan. 12.

THE month to date has not been as productive of machine-tool business as the same period in December. The trade, however, is inclined to regard the dullness as natural to the time of year during which period budgets for future expenditures are usually made. There is still a good inquiry for tools and pending business is of proportions that suggest a better year than usual. Machine tool dealers regard the purchase of modern and efficient tools to be no contravention of economy, but rather an exemplification of it. The National Tube Co. has issued a list for 15 tools for its McKeesport, Pa., works. Inquiries for single tools are numerous.

Plans have been filed by the American Nut & Bolt Co., 2450 Ontario Street, Pittsburgh, for extensions and improvements to cost $30,000.

The Joseph Woodwell Co., 201 Wood Street, Pittsburgh, hardware products, has awarded a general contract to the Pittsburgh Engineering & Construction Co., 511 Homewood Avenue, for a new works and distributing plant at 225 Second Avenue, to cost $75,000.

The Hope Natural Gas Co., Wheeling, W. Va., is planning the construction of a new pipe line from the present terminus in Gilmer County, W. Va., to the southwestern portion of the State, about 100 miles, estimated to cost $2,000,000.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for an engine lathe, suitable for turning locomotive tires up to 36 in. in diameter, with two carriages; one hydraulic horizontal wheel press, 200 to 300 tons capacity, 38 in. between strain bars, motor-driven, and a number of cast iron pulleys, 4 x 4 in. to 10 x 10 in., and split steel pulleys, 6 x 6 in. to 10 x 36 in.

The Highland Brick & Tile Co., Winburne, Pa., has awarded a general contract to E. A. Hess, Winburne, for three new buildings, 35 x 76 ft., 35 x 80 ft., and 40 x 40 ft., estimated to cost $45,000 with equipment.

The Board of Education, Erie, Pa., plans the installation of manual training equipment in its proposed Wilson junior high school estimated to cost $750,000. W. W. Meyers, Library Building, is architect.

The Union Sand & Gravel Co., Twentieth and River First Streets, Huntington, W. Va., has about 125 acres of sand and gravel deposits at Raccoon Island. Plans are under way to develop an output of about 1200 cu. yd. per day, including suction and ladder dredges, conveying, loading and other machinery. J. L. Richmond is treasurer and general manager.

The Southern Gas & Power Corporation, Bluefield, W. Va., operating the Bluefield Gas & Power Co., and other utilities in West Virginia, Virginia and North Carolina, has disposed of a note issue of $800,000, a portion of the proceeds to be used for extensions and improvements. Walter Whetstone is president.

The Clarksburg Big Vein Coal Co., Clarksburg, Va., operating the Whiteman mine, is planning to rebuild its aerial tramway, destroyed by an explosion Jan. 3.

## Canada

TORONTO, Jan. 12.

THE machine-tool industry is beginning to resume activities following the quiet period of the past two or three weeks. Inquiries are increasing, but so far the majority is for single tools. A revival in demand is reported for second-hand and rebuilt tools, but the chief interest is toward labor and time-saving equipment. A strong demand for waterworks, sewage and electrical equipment has sprung up since the first of January, and extensive buying along these lines is expected during the next six weeks. Several millions of dollars also will be spent on mining equipment this year. Prices are showing a strong tendency and in some quarters advancing quotations are looked for.

The Montreal Tramways Co., Montreal, has awarded contract for the construction of a sub-station and car barn at Mount Royal Avenue and Fullum Street. Two 2000-kw. rotary converters will be installed in the sub-station. The company also plans to build another sub-station at St. Laurent in which will be installed two 500 kw. rotary converters.

The city of Toronto, Thomas Foster, mayor, will receive bids until Jan. 20 for one 3,000,000 gal. centrifugal sludge pump and motor.

Charles Burkholder, Tillsonburg, Ont., is in the market for tools for a tinsmith shop, including sheet metal squaring shears to cut 18 gage sheets up to 46 in. long.

The Preston Woodworking Machinery Co., Preston, Ont., is in the market for electric motors.

Fire which broke out in the machine shop of the American Radiator Co., 1322 Dufferin Street, Toronto, Jan. 8, resulted in damage to the plant and equipment estimated at $75,000. The fire was chiefly confined to the machine shop, which was filled with equipment for the manufacture of radiators, and this department will be a total loss. The plant will be repaired and new tools installed without delay.

The nail and wire departments of the Northern Bolt, Screw & Wire Co., Ltd., Owen Sound, Ont., were destroyed by fire with a loss to building and equipment estimated at between $50,000 and $75,000. While no definite announcement has been made, it is expected that the plants will be rebuilt without delay and new equipment will be purchased.

A. B. Greer & Son, London, Ont., manufacturers of funeral cars, ambulances, etc., whose plant was partially destroyed by fire Dec. 13, will rebuild in the spring. A larger factory will be erected and new tools installed.

### Western Canada

The Burrard Drydock Co., Vancouver, B. C., has recently taken out a permit for the construction of a complete plant outside the drydock itself estimated to cost $1,000,000. Plans call for one pile pier, 32 ft. wide x 400 ft. long; one concrete pier, 50 ft. wide x 700 ft. long; three shops, 75 x 220 ft., 40 x 100 ft. and 30 x 80 ft. respectively. A. D. Swann, Montreal, is architect, and the contractors are the Northern Construction Co., J. W. Stewart & Hodgins, and King & Marble.

## The Gulf States

BIRMINGHAM, Jan. 12.

TENTATIVE plans are being considered by the A. & J. Mfg. Co., Gadsden, Ala., manufacturer of stoves and fittings, for a one-story addition, 80 x 100 ft. Another building is also contemplated. It is proposed to double approximately the present capacity.

The Celotex Co., New Orleans, with headquarters at Chicago, manufacturer of wallboard products from sugar cane waste, is arranging for the construction of a new branch mill in Australia, reported to cost in excess of $650,000. Necessary machinery will be purchased in the United States and shipped to the new works. The company has arranged for a bond issue of $1,250,000, a portion of the proceeds to be used for this and other expansion. T. B. Monroe is vice-president.

T. R. McElwee, 845 First Avenue, N. E., Miami, Fla., is at the head of a project to construct and operate a plant for the manufacture of furniture, and has inquiries out for information regarding machinery.

The Texas Central Power Co., Frost Building, San Antonio, Tex., is considering plans for the construction of a steam-operated power house at Corpus Christi, Tex., and is said to be planning the early purchase of boiler, engine, generator and auxiliary apparatus.

The Texas Utilities Co., Lubbock, Tex., is arranging for a new ice-manufacturing plant with initial capacity of about 50 tons per day. H. A. Allen is general manager.

L. L. Richardson, 119 Sunset Avenue, Sarasota, Fla., is planning to purchase a boiler and accessory equipment for installation in a local light and power plant.

The Texas Coal & Mining Co., Eagle Pass, Tex., recently organized, has acquired the local properties of the International Coal Mines Co. and plans the early installation of additional machinery. C. W. Settle is president, and W. B. McBride, assistant manager.

The Board of Education, Jacksonville, Fla., is considering the establishment of a vocational school in connection with a program of construction to cost about $250,000.

The Common Council, Bradentown, Fla., is said to be planning the installation of pumping machinery in connection with a proposed municipal waterworks, estimated to cost $350,000, for which bonds have been voted.

The Humble Oil & Refining Co., Houston, Tex., is contemplating the construction of a pipe line, with pumping stations, etc., from Kemper, Tex., to a point near San Angelo, Tex., about 130 miles, to cost in excess of $500,000.

The Sewerage and Water Board, 526 Carondelet Street, New Orleans, A. G. Moffat, secretary, will take bids until Feb. 16 for a steam turbine-driven pump, with capacity of 400 gal. per min., for boiler feed-water service; also a similar unit, capacity 200 gal. per min., and for one motor-driven centrifugal pump, 2800 gal. per min.

George M. Easley, 4219 Hall Street, Dallas, Tex., has plans for a three-story automobile service, repair and garage building, 50 x 100 ft., at Bryan and Bullington Streets, to cost $55,000.

The Board of Education, Jackson, Miss., plans the installation of manual training equipment in the two-story junior and senior high school to be erected on West Street, estimated to cost $200,000, for which foundations will be laid at once. C. H. Lindsley, Kress Building, is architect.

## Trade Changes

Joseph J. Beeman, 14559 Hubbell Avenue, Detroit, has been appointed agent to cover the Detroit territory, and the Industrial Equipment Co., Jackson Building, Buffalo, agent to cover the Buffalo territory for the Swartwout Co., industrial oven engineer and manufacturer, Cleveland.

The Rosiclare Lead & Fluorspar Mining Co., Washington, producer of gravel, lump and ground fluorspar from mines at Rosiclare, Ill., has appointed Oglebay, Norton & Co., Cleveland, general manager and exclusive sales agent.

The Stockbridge Machine Co., maker of crank shapers, Worcester, Mass., has appointed representatives as follows: D. J. Normoyle, 514 Liberty Building, Philadelphia; Starr Equipment Co., Arrott Building, Pittsburgh; D. E. Morand Machinery Co., 8784 Quincy Avenue, Detroit.

The Foote Brothers Gear & Machine Co., Chicago, has completed arrangements with the Thrall Electric Co., Havana, Cuba, for exclusive representation of IXL gear products and speed reducers in Cuba.

The Hanson Tap & Gauge Co. has been merged with the Hanson-Whitney Machine Co., both of Hartford, Conn., and the combined interests will be operated under the name of the Hanson-Whitney Machine Co. The Whitney Mfg. Co., Hartford, and the Hanson-Whitney company will jointly maintain offices in a number of leading industrial centers. Two offices already have been opened, one in the General Motors Building, Detroit, the other in Machinery Hall, Chicago.

Aktiebolaget Alpha, Sundbyberg, near Stockholm, Sweden, has appointed Herman A. Holz, testing engineer, 17 Madison Avenue, New York, as sole agent for the sale of its various types of Brinell hardness testing machines in the United States. All machines may be supplied now with special steel balls permitting accurate Brinell tests on materials up to No. 700 Brinell.

The American Kreuger & Tool Corporation, importer and manufacturer of chemicals and apparatus, 522 Fifth Avenue, New York, has moved to the following address: Scientific Supply Division, Engineering Building, 114-18 Liberty Street.

The Schapp Iron & Steel Corporation, formerly at 344 Cumberland Street, Brooklyn, has moved to Catasauqua, Pa.

The Williams Gauge Co., Pittsburgh, is located at its new plant, 1620 Pennsylvania Avenue, N. S., Pittsburgh.

The Diamond Power Specialty Corporation, Detroit, manufacturer of diamond soot blowers for water tube and horizontal return tubular boilers, has appointed the Midwest Machinery Co., 104-06 South Main Street, St. Louis, as representative for the territory of Missouri adjacent to St. Louis, south of and including Springfield and Decatur, Ill.

The St. Louis office of the Domhoff & Joyce Co., pig iron, coke and coal, Cincinnati, has been moved from 800 Times Building to 1304 Liberty Central Trust Building, Broadway and Olive Street, and Stephen McGovern, Jr., has been appointed St. Louis manager.

The Carborundum Co., Niagara Falls, N. Y., has moved its Chicago store from 558 West Washington Boulevard to 111 North Canal Street.

The Reeve-Fritts Co., machine tool dealer, 37 South Desplaines Street, Chicago, has moved to 558 West Washington Boulevard.

The entire holdings of the Drake Lock-Nut Co., San Francisco, recently have been taken over by George F. Drake, founder and for the past eight years vice-president and manager of the company.

Plant and general offices of the Norma-Hoffmann Bearings Corporation, Anable Avenue, Long Island City, N. Y., have been moved to the new factory at Stamford, Conn. Its Long Island City office has been discontinued and all shipments will now be made from Stamford.

The Fawcus Machine Co., Pittsburgh, gear maker, has appointed Presley A. Hamilton, 149 Broadway, New York district representative, effective Jan. 1. The company has been represented for several years by Robert C. Brown, 84 Pine Street, New York, who has resigned to enter another line of business.

The office of Arthur H. Jones, sales representative in Seattle for the Trumbull Steel Co., Warren, Ohio, in the sale of tin plate and sheets, and also of the Worth Steel Co., Claymont, Del., in the sale of plates, has been moved from Room 1414 to Room 1314 in the L. C. Smith Building, Seattle.

The St. Louis branch office of the Link-Belt Co. has been moved from 705 Olive Street to larger offices at 3638 Olive Street.

The E. L. Essley Machinery Co., Chicago, has been appointed exclusive sales representative in the Chicago district for the Foster Machine Co., Elkhart, Ind., manufacturer of turret lathes.

The Northwest Engineering Co., Chicago, manufacturer of gasoline convertible cranes, draglines and shovels, announces the removal of their sales office to the seventeenth floor of the Steger Building, 28 East Jackson Boulevard.

The Smith & Woodbury Co., 55 Second Street, Portland, Ore., has been appointed distributor for Oregon and southwest Washington by the Chicago Pneumatic Tool Co. and will stock a complete line of pneumatic and electric tools, rock drills, air compressors and semi-diesel oil engines. An up-to-date service department also will be maintained in Portland.

The Westinghouse Electric & Mfg. Co. has practically completed negotiations for taking over the Wetmore Savage Co., Boston, electrical supply business. The Boston firm will continue to deal in automobile accessories.

The Lebanon Iron Co., maker of bar iron, nuts, bolts and spikes, has changed its address to 1717 Bankers Trust Building, Philadelphia.

The Marr-Galbreath Machinery Co., Pittsburgh, has moved to its new location, 58 Water Street, which affords space 100 per cent greater than at the former location.

The Hammond-Byrd Iron Co., Birmingham, Ala., has changed its corporate name to the Hammond Iron Co.

## Thyssen Steel Works Bonds Sold

Bankers have sold $12,000,000 August Thyssen Iron & Steel Works five-year 7 per cent sinking fund gold bonds dated Jan. 1, 1925. This is the second German steel works securities issue to be sold in the United States within a month, the other being $10,000,000 Fried Krupp, Ltd., bonds. The bonds just sold are not only an obligation of the August Thyssen Iron & Steel Works (August Thyssen-Hutte Gewerkschaft), but affiliated mining and sales companies as well. Its properties are valued by an American consulting engineer at $117,183,500. The mortgage is subject to underlying liens securing less than $1,250,000 of obligations, and to reparation charges under the Dawes plan estimated at not more than $152,000 for the year ending Aug. 31, 1926, and increasing annually to a maximum of not more than $330,000 in 1928. The company produces coal, coke, pig iron, steel ingots, and a large variety of semi-finished and finished steel products, and employs more than 37,000 operatives. Money derived from the sale of the bonds will be used for additional working capital, for the further development of the company's collieries and for other improvements.

B. D. Thomas, Pittsburgh, has acquired plant and equipment of the Armstrong Steel Casting Co., Huntington, Ind., from W. W. Hawley, the receiver, and will reorganize the company, assuming the name of the Thomas Electric Steel Corporation. It is planned to reopen the plant about March 1. Officers of the new concern will be: B. D. Thomas, president; Eben Lesh, vice-president, and Joel Tobin, secretary-treasurer.

The new plants of the Coplan Steel Co., Ogdensburg, N. Y., manufacturer of special heat resisting steel products, have been completed and operations commenced Jan. 2 under the direction of President A. Coplan. The main building is a one-story structure, 85 x 300 ft., on a site of about 10 acres along the St. Lawrence River.

Beginning Jan. 3, the East Salamanca, N. Y., shops of the Buffalo, Rochester & Pittsburgh Railway went on a working week of six days instead of five. The Dubois, Pa., shops of the same railroad, which have been shut down since Dec. 13, have reopened on a like schedule.

The Reeves Mfg. Co., Dover, Ohio, manufacturer of galvanized ware products, has acquired plant and equipment of the McLaughlin Co., Brockport, N. Y., and will move it to Dover within six months.


## Branch Offices of the Iron Age

Chicago.....1507 Otis Building
Pittsburgh..1002 Park Building
Boston
425 Park Square Building
Philadelphia
1402 Widener Building
Cleveland
538 Guardian Building
Detroit....7338 Woodward Ave.
Cincinnati
First National Bank Building
Buffalo.....823 Ellicott Square
Washington
536 Investment Building
San Francisco...320 Market St.
London, England
11 Haymarket, S. W. 1

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# Current Metal Prices

**On Small Lots, Delivered from Merchants' Stocks, New York City**

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

### Bars, Shapes and Plates

| | Per Lb. |
|---|---|
| Bars: | |
| Refined iron bars, base price | 3.24c. |
| Swedish charcoal iron bars, base | 7.00c. to 7.25c. |
| Soft steel bars, base price | 3.24c. |
| Hoops, base price | 4.49c. |
| Bands, base price | 3.99c. |
| Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base | 3.34c. |
| Channels, angles and tees under 3 in. x ¼ in., base | 3.24c. |
| Steel plates, ¼ in. and heavier | 3.34c. |

### Merchant Steel

| | Per Lb. |
|---|---|
| Tire, 1½ x ½ in. and larger | 3.20c. |
| (Smooth finish, 1 to 2½ x ¼ in. and larger) | 3.55c. |
| Toe-calk, ½ x ⅜ in. and larger | 4.20c. |
| Cold-rolled strip, soft and quarter hard | 7.00c. |
| Open-hearth spring steel | 4.50c. to 7.00c. |
| Shafting and Screw Stock: | |
| Rounds | 4.15c. |
| Square, flats and hex | 4.65c. |
| Standard tool steel, base price | 15.00c. |
| Extra tool steel | 18.00c. |
| Special tool steel | 23.00c. |
| High-speed steel, 18 per cent tungsten | 70c. |

### Sheets

*Blue Annealed*

| | Per Lb. |
|---|---|
| No. 10 | 3.89c. |
| No. 12 | 3.94c. |
| No. 14 | 3.99c. |
| No. 16 | 4.09c. |

*Box Annealed—Black*

| | Soft Steel C. R. One Pass Per Lb. | Blued Stove Pipe Sheet Per Lb. |
|---|---|---|
| Nos. 18 to 20 | 4.30c. to 4.45c. | ..... |
| Nos. 22 and 24 | 4.45c. to 4.60c. | 5.10c. |
| No. 26 | 4.50c. to 4.65c. | 5.15c. |
| No. 28* | 4.60c. to 4.75c. | 5.25c. |
| No. 30 | 4.70c. to 4.95c. | ..... |

*Galvanized*

| | Per Lb. |
|---|---|
| No. 14 | 4.70c. to 4.85c. |
| No. 16 | 4.85c. to 5.00c. |
| Nos. 18 and 20 | 5.00c. to 5.15c. |
| Nos. 22 and 24 | 5.15c. to 5.30c. |
| No. 26 | 5.30c. to 5.45c. |
| No. 28* | 5.60c. to 5.75c. |
| No. 30 | 6.10c. to 6.25c. |

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

*Welded Pipe*

| *Standard Steel* | Black | Galv. | *Wrought Iron* | Black | Galv. |
|---|---|---|---|---|---|
| ½ in. Butt | —46 | —29 | ½ in. Butt | — 4 | +19 |
| ¾ in. butt | —51 | —37 | ¾ in. Butt | —11 | + 9 |
| 1-3 in. Butt | —53 | —39 | 1-1½ in. Butt | —14 | + 6 |
| 2½-6 in. Lap | —48 | —35 | 2 in. Lap | — 5 | +14 |
| 7 & 8 in. Lap | —44 | —17 | 3-6 in. Lap | —11 | + 6 |
| 11&12 in. Lap | —37 | —12 | 7-12 in. Lap | — 3 | +16 |

### Bolts and Screws

Machine bolts, cut thread, 45 and 10 per cent off list
Carriage bolts, cut thread, 35 to 35 and 10 per cent off list
Coach screws, 45 and 10 per cent off list
Wood screws, flat head iron, 75, 20, 10 and 5 per cent off list

### Steel Wire

| BASE PRICE* ON NO. 9 GAGE AND COARSER | Per Lb. |
|---|---|
| Bright, basic | 4.25c. to 4.50c. |
| Annealed soft | 4.50c. to 4.75c. |
| Galvanized annealed | 5.15c. to 5.40c. |
| Coppered basic | 5.15c. to 5.40c. |
| Tinned soft Bessemer | 6.15c. to 6.40c. |

*Regular extras for lighter gage.

### Brass Sheet, Rod, Tube and Wire

BASE PRICE

| | |
|---|---|
| High brass sheet | 19⅝c. to 20⅝c. |
| High brass wire | 19⅞c. to 20⅞c. |
| Brass rods | 17⅝c. to 18⅝c. |
| Brass tube, brazed | 27⅝c. to 28⅝c. |
| Brass tube, seamless | 24 c. to 25 c. |
| Copper tube, seamless | 25 c. to 26 c. |

### Copper Sheets

Sheet copper, hot rolled, 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

### Tin Plates

| Bright Tin Grade "AAA" Charcoal 14x20 | Bright Tin Grade "A" Charcoal 14x20 | Coke—14 x 20 | Prime | Seconds |
|---|---|---|---|---|
| | | 80 lb. | $6.15 | $5.90 |
| | | 90 lb. | 6.30 | 6.05 |
| | | 100 lb. | 6.45 | 6.20 |
| IC | $11.25 | IC | 6.65 | 6.40 |
| IX | 12.85 | IX | 7.85 | 7.60 |
| IXX | 14.40 | IXX | 9.00 | 8.75 |
| IXXX | 15.75 | IXXX | 10.35 | 10.10 |
| IXXXX | 17.00 | IXXXX | 11.35 | 11.10 |

### Terne Plates

8 lb. coating, 14 x 20

| | |
|---|---|
| 100 lb. | $7.00 to $8.00 |
| IC | 7.25 to 8.25 |
| IX | 8.25 to 8.75 |
| Fire door stock | 9.00 to 10.00 |

### Tin

| | |
|---|---|
| Straits, pig | 63c. |
| Bar | 68c. to 70c. |

### Copper

| | |
|---|---|
| Lake ingot | 16¾c. |
| Electrolytic | 16½c. |
| Casting | 16 c. |

### Spelter and Sheet Zinc

| | |
|---|---|
| Western spelter | 9¼c. |
| Sheet zinc, No. 9 base, casks | 12c. open 12½c. |

### Lead and Solder*

| | |
|---|---|
| American pig lead | 11¾c. to 12¾c. |
| Bar lead | 15c. |
| Solder, ½ and ½ guaranteed | 43½c. |
| No. 1 solder | 41c. |
| Refined solder | 35c. |

*Prices of solder indicated by private brand vary according to composition.

### Babbitt Metal

| | |
|---|---|
| Best grade, per lb. | 75c. to 90c. |
| Commercial grade, per lb. | 35c. to 50c. |
| Grade D, per lb. | 25c. to 35c. |

### Antimony

| | |
|---|---|
| Asiatic | 20c.to 21c. |

### Aluminum

| | |
|---|---|
| No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb | 36c. |

### Old Metals

Demand is active and values are firm. Dealers' buying prices are as follows:

| | Cents Per Lb. |
|---|---|
| Copper, heavy crucible | 12.75 |
| Copper, heavy wire | 12.50 |
| Copper, light bottoms | 10.50 |
| Brass, heavy | 8.00 |
| Brass, light | 6.75 |
| Heavy machine composition | 9.50 |
| No. 1 yellow brass turnings | 9.00 |
| No. 1 red brass or composition turnings | 9.00 |
| Lead, heavy | 9.00 |
| Lead, tea | 7.25 |
| Zinc | 4.75 |
| Cast aluminum | 17.00 |
| Sheet aluminum | 17.00 |